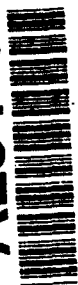


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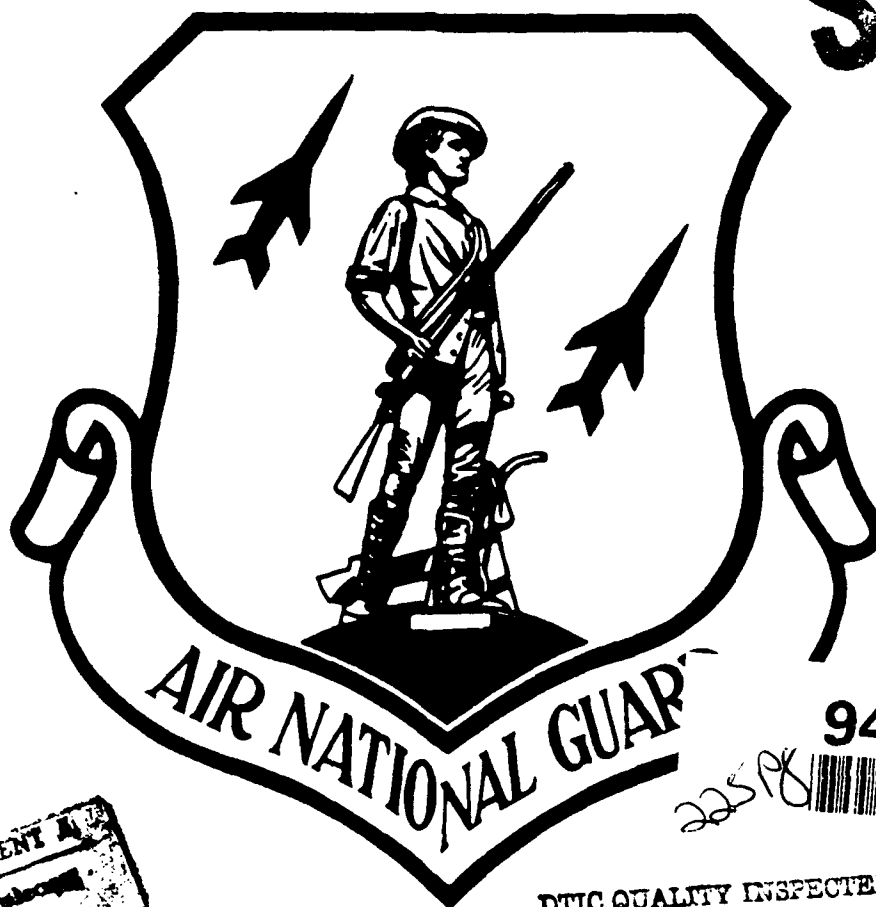


WISCONSIN AIR NATIONAL GUARD  
VOLK FIELD  
CAMP DOUGLAS, WISCONSIN

UNDERGROUND STORAGE TANK  
CLOSURE ASSESSMENT REPORT  
HARDWOOD RANGE

MARCH, 1994

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**RAPID RESPONSE INITIATIVE  
UNDERGROUND STORAGE TANK INVESTIGATIONS**

**SITE ASSESSMENT FOR UNDERGROUND STORAGE TANK  
CLOSURE REPORT FOR  
HARDWOOD RANGE SITE  
WISCONSIN AIR NATIONAL GUARD  
VOLK FIELD  
CAMP DOUGLAS, WISCONSIN**

*Prepared for:*

**Air National Guard Readiness Center  
ANGRC/CEVR  
Andrews Air Force Base, Maryland 20331-6008**

*Submitted to:*

**Hazardous Waste Remedial Actions Program  
Managed by Martin Marietta Energy Systems, Inc.  
Oak Ridge, Tennessee 37830  
For the U.S. Department of Energy Under Contract DE-AC-05-84OR21400**

*Prepared by:*

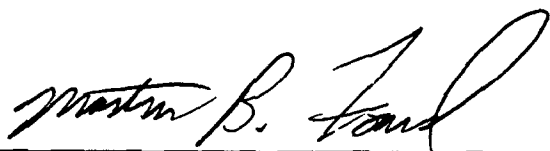
**Advanced Sciences, Inc.  
165 Mitchell Road  
Oak Ridge, Tennessee 37830**

**March, 1994**

**DTIC QUALITY INSPECTED 3**

## CERTIFICATION

The following site assessment has been prepared and reviewed by the person named below who is a certified site assessor for the state of Wisconsin in accordance with Administrative Rule ILHR-10.



Martin B. Foard

Certification #5630

<b>Accession For</b>	
NTIS CRA&I	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By <i>per Cover</i>	
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<b>Availability Codes</b>	
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## LIST OF ACRONYMS AND ABBREVIATIONS

ANG	Air National Guard
ANGRC	Air National Guard Readiness Center
ASI	Advanced Sciences, Inc.
CRTC	Combat Readiness Training Center
DOE	U.S. Department of Energy
DRO	diesel range organics
ft	Foot/Feet
gal	Gallon(s)
GRO	gasoline range organics
HAZWRAP	Hazardous Waste Remedial Actions Program
IAG	Interagency Agreement
NFPA	National Fire Protection Association
NGB	National Guard Bureau
PID	Photoionization Detector
RI	remedial investigation
RRI	Rapid Response Initiative
UST	underground storage tank
WANG	Wisconsin ANG
WDNR	Wisconsin Department of Natural Resources

## **1.0 INTRODUCTION**

The Air National Guard Readiness Center (ANGRC) has developed the Rapid Response Initiative (RRI) to conduct site assessments, evaluate potential corrective actions, and design the selected remedies at leaking underground storage tank (UST) and spill sites at Air National Guard (ANG) facilities. The U.S. Department of Energy (DOE), through an existing Interagency Agreement (IAG) with the Air Force, provides technical assistance in implementing the RRI for the National Guard Bureau (NGB). Martin Marietta Energy Systems, Inc. was assigned the responsibility of managing the Hazardous Waste Remedial Actions Program (HAZWRAP) for DOE. This site assessment report was prepared by Advanced Sciences, Inc. (ASI) under the direction of HAZWRAP.

## **2.0 SITE BACKGROUND INFORMATION**

This report documents UST site assessment and closure activities conducted at the Hardwood Range, which is a facility operated by the Wisconsin ANG (WANG), Volk Field Combat Readiness Training Center (CRTC). The following site background information is provided in the sequence recommended by the Wisconsin Department of Natural Resources (WDNR) technical guidance publication, PUBL-SW-175-92, *Site Assessments for Underground Storage Tanks* (WDNR 1992).

### **2.1 UST SYSTEM OWNER/OPERATOR**

The WANG is the owner and operator of the Hardwood Range UST site.

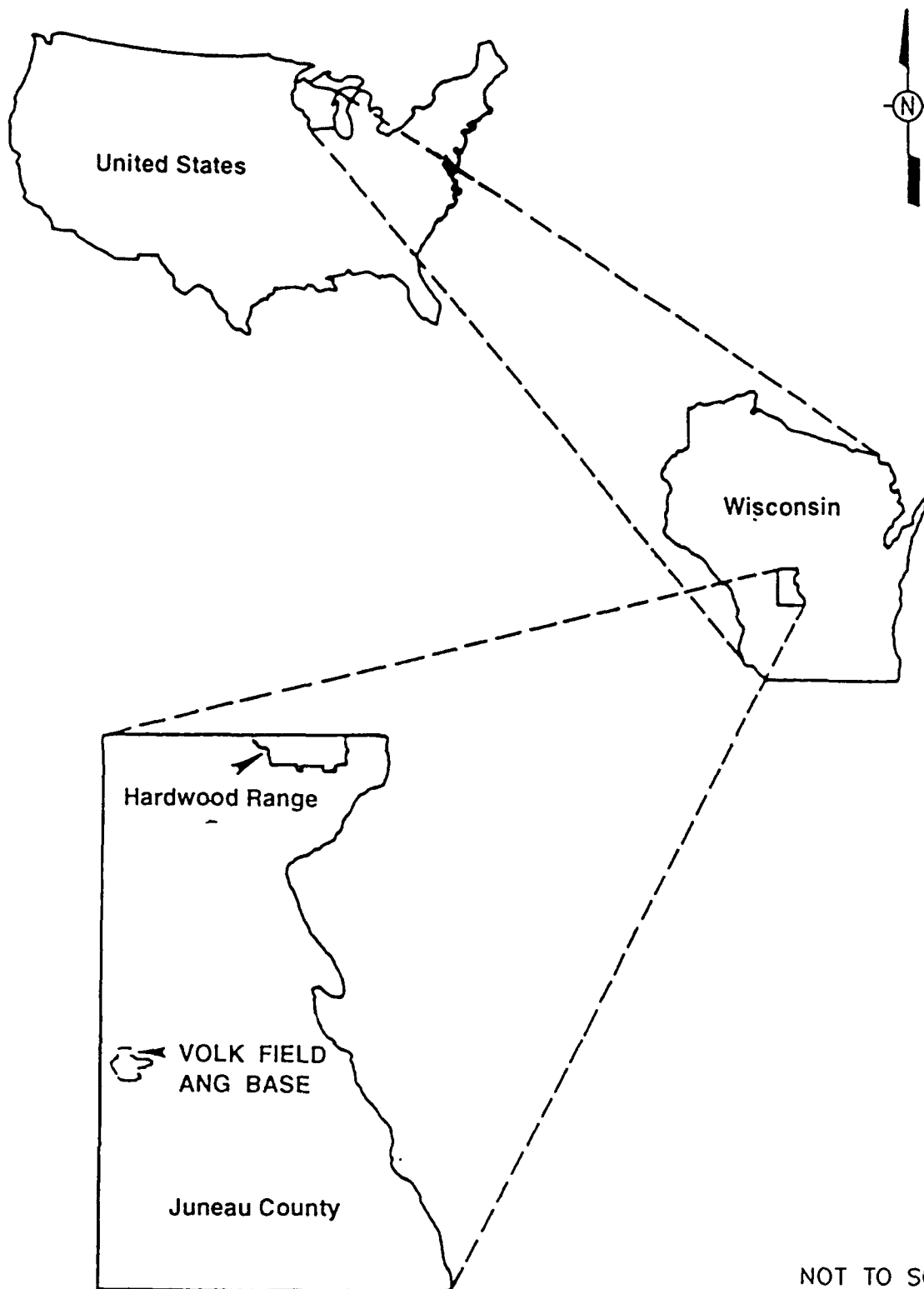
### **2.2 LAND OWNER**

The land owner of the property on which Hardwood Range is located is the State of Wisconsin, who leases the property to the U.S. Government.

### **2.3 LOCATION**

The location of the site is ½-mile north of fourth street, 1-mile east of Finley, Wisconsin. The legal description is Township 20N, Range 4E, Section 2 SE 1/4 NW 1/4, Base Meridian Fourth Principal.

Hardwood Range consists of 7300 acres that lie approximately 110 miles northwest of Madison in the extreme northeast corner of Juneau County, Wisconsin (Figure 2.1).



SOURCE: HMTc, 1984

ADVANCED SCIENCES, INC.		FIGURE 2.1 Facility Location Map	Wisconsin Air National Guard Volk Field, Wisconsin
FILE: VOLK10	DATE: 1994		

## **2.4 CERTIFIED SITE ASSESSOR**

Site assessor information associated with the Hardwood Range UST closure is as follows:

Name/Company: Martin B. Foard - Advanced Sciences, Inc. (ASI)  
Address: 165 Mitchell Rd., Oak Ridge, TN 37830  
Telephone Number: (615) 483-1274  
DILHR Certification No.: 05360

## **2.5 SITE ASSESSMENT SUBCONTRACTORS**

Laboratory analytical services were subcontracted by ASI. Tank cleaning and tank removal supervision were subcontracted by WANG.

### Analytical Laboratory

WARZYN Laboratories  
One Science Court  
P.O. Box 5385  
Madison, WI 53705-0385  
Phone: (608) 231-4747

### Tank Cleaners

Dan Kelly  
Fuel Tank Services  
Box 74 - Hwy 70  
Loretta, WI 54896  
Phone: (715) 266-3612  
DILHR Certification No: 00458

### Tank Removers

WANG Volk Field Civil Engineering under the supervision of:

Bob Belock  
Bancroft and Belock, Inc.  
Environmental Construction  
990 Hillcrest Street, #107  
Baldwin, WI 54002  
Phone: (715) 684-4077  
DILHR Certification No: 00705

## **2.6 SUMMARY OF PAST AND PRESENT PROPERTY USE**

The Hardwood Range facility is used for bombing and gunnery exercises by the WANG and for this reason is located in a relatively isolated and sparsely populated area. Structures at the facility include three observation towers, two garages, and one administrative building. Otherwise the facility consists of undeveloped land with unpaved roads leading to various bombing and gunnery impact areas. The entire area is flat and much of it is wetlands (Figure 2.2).

At the time of tank closure, the Hardwood Range UST site consisted of two inactive USTs: one 1,000-gallon (gal) unleaded gasoline tank and one 560gal diesel tank. The two USTs were located in a gravel parking area approximately 20ft from the nearest structure as shown in Figure 2.3. Although the exact dates of operation are not known, the unleaded gasoline tank was last operated in mid-1991 and the diesel tank was last operated in 1992. No other USTs are present at Hardwood Range and none have been removed previously from any location at the Hardwood Range facility.

## **2.7 RESULTS OF PREVIOUS TIGHTNESS TESTS**

The results of a tightness testing performed by a contractor on the 560gal diesel UST on October 31, 1991 indicated that it was not leaking. This testing was done in accordance with National Fire Protection Association (NFPA) Method 329 criteria with the tank 58% full of fluid. The leak testing data indicated at that time that the UST was in compliance with leak tightness criteria of NFPA Method 329. The 1000gal gasoline UST had previously been found to contain groundwater (from seepage or runoff). Therefore, no leak testing was conducted on this UST and it was scheduled for removal. No previous tightness test information for this gasoline tank was available at the time of the site assessment.

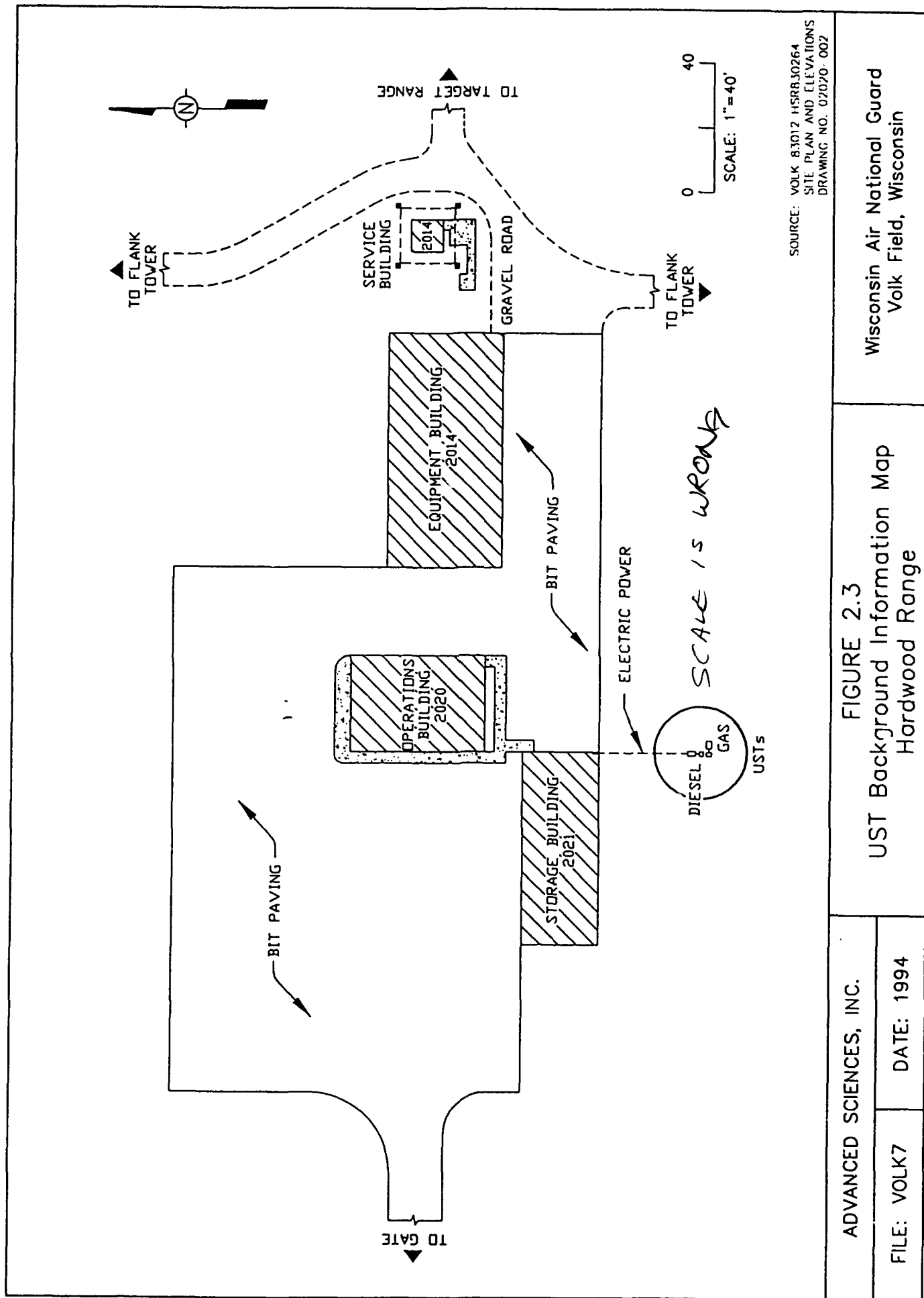
No information is available which indicates that repairs were ever performed on the system to fix leaks or other problems.

## **2.8 RESULTS OF PREVIOUS INVESTIGATIONS**

An IRP remedial investigation (RI) activity was performed during 1991 at a munitions burial site located on the southwest side of Hardwood Range, approximately 1600ft south-southwest of the UST site. The munitions site (Site 10) has been used for the burning and burial of spent munitions. A description of the site and field activities are located in the preliminary assessment (HMTG, 1984) and in the remedial investigation report (ES, 1993).

The results from these RI activities are not directly applicable to the UST closure activities. However, the installation of a groundwater monitoring well at the IRP site provided information about subsurface conditions in the area of the UST site. The soil is sandy and moderately to excessively drained. There is no gravel in the subsoil and the silt content is very small. There





ADVANCED SCIENCES, INC.

FILE: VOLK7

DATE: 1994

FIGURE 2.3  
UST Background Information Map  
Hardwood Range

Wisconsin Air National Guard  
Volk Field, Wisconsin

has been no preliminary assessment performed on the UST site or any other area of the Hardwood Range Facility.

There are no other tanks, gas stations, or LUSTs on any surrounding properties which would be close enough to have any affect on the Hardwood Range or the UST site located there. It is estimated that the nearest off-site UST is at least two miles away.

## **2.9 GROUNDWATER INFORMATION**

Recharge of all groundwater in the Wisconsin region in which Hardwood Range is located is provided almost entirely from surface water infiltration, precipitation, and snow melt. Therefore, the depth of the water table in this area is directly related to the amount of precipitation and varies from 4-10ft below the ground surface (ES 1991). On the day of the closure assessment, the water table was encountered at a depth of 4-5ft during the UST excavation. This meant that the bottom 1-2ft of the USTs were below the water table at that time.

## **3.0 TANK ACTIVITIES AND EXCAVATION**

The two adjacent inactive USTs, one 1,000gal unleaded gasoline tank and one 560gal diesel tank, are located at Hardwood Range; one of which was suspected of leaking prior to removal (see Section 2.7). Due to the permanent inactive status of both USTs, the site was to be closed under current Wisconsin UST regulations, which in this case involved removal of both USTs. The objective of closure activities as specified in the Closure Assessment Work Plan (ASI 1993), therefore, was to remove the two USTs and confirm or deny the presence of leaked or spilled petroleum hydrocarbon contamination at the time of UST removals. The Closure Assessment Work Plan incorporated all necessary requirements as specified in the WDNR technical guidance document *Site Assessments for Underground Storage Tank* (WDNR 1992). Based upon the results of the closure assessment activities performed, a decision will be made as to whether further corrective action is necessary at the site. This closure report provides the results of the closure assessment activities as well as the recommendation that no further action is necessary at the site.

### **3.1 METHOD OF TANK CLOSURE**

The method of closure for both USTs was to remove them along with additional overexcavated soil that proved to be contaminated by field screening at the time of tank removal.

### **3.2 TANK CLOSURE INFORMATION**

- Date of Removal: Both USTs were removed on July 28, 1993.



- DILHR Certified Remover/Cleaner

Removal of the tanks was performed by:

WANG Volk Field Civil Engineering under the supervision of:

Bob Belock  
Bancroft and Belock, Inc.  
Environmental Construction  
990 Hillcrest Street, #107  
Baldwin, WI 54002  
Phone: (715) 684-4077  
Certification No. 00705

Tank cleaning was performed by:

Dan Kelly  
Fuel Tank Services  
Box 74, Highway 70  
Loretta, WI 54896  
Phone: (715) 266-3612  
Certification No. 00458

- Subcontractors

Confirmation Sample Analysis:

WARZYN Laboratories  
One Science Court  
P.O. Box 5385  
Madison, WI 53705-0385  
Phone: (608) 231-4747

WANG is providing for disposal of waste waters and for procurement of subcontractors for disposal of sludge and contaminated soils. No drilling was involved during this phase of the site assessment.

- Description of Tanks Removed:

Tank 1

Tank 2

Size: 1,000gal      Size: 560gal

Age: Approximately 10 years      Age: Approximately 10 years

Substance Stored:      Unleaded Gasoline      Substance Stored:      Diesel Fuel

- Number of Tanks remaining on site: None

## 4.0 TANK CLEANING AND DISPOSAL

### 4.1 WASTEWATER

On the day prior to site assessment activities (July 27, 1993), WANG personnel pumped approximately 1,800gal of groundwater from the two USTs which had infiltrated into the tanks since they both became inactive. An additional amount of water (<100gal) was pumped from the diesel tank immediately prior to excavation activities the following day. Of this wastewater was pumped into a truck-mounted tank for transport back to Volk Field for disposition. The WANG Volk Field Environmental Staff provided for disposal of this water.

Additional residual waters and sludge remaining in the two USTs were removed by the certified tank cleaning contractor after the USTs were removed from the ground. This waste material was drummed for disposition by WANG Volk Field Environmental Staff.

### 4.2 TANK CLEANING AND DISPOSAL INFORMATION

- Location: All tank cleaning activities were conducted at the Hardwood Range UST site.
- Method of Tank Transport: Tanks remained at Hardwood Range.
- Documentation of emergency waiver to transport tank: Not Applicable.
- Tank Dismantling: -

#### Labor

Dan Kelley  
Fuel Tank Services  
Box 74 - Hwy 70  
Loretta, WI 54896  
Phone: (715) 266-3612

#### Supervision

Bob Belock  
Bancroft and Belock, Inc.  
Environmental Construction  
990 Hillcrest Street, #107  
Baldwin, WI 54002  
Phone: (715) 684-4077

Tank Transporting and Disposing: Hardwood Range personnel relocated tanks for salvaging.

## 5.0 SURPLUS PRODUCT MANAGEMENT

No surplus product was found in either of the USTs at the time of closure. Only groundwater with a very slight odor was found to be present in either UST. Information regarding the groundwater found in the USTs at the time of closure and the final disposition of these products is provided below:

- Types of liquids: groundwater
- Quantity of liquids: 1,800gal groundwater (approximate combined volume of the two tanks)
- Final disposition of liquids: disposed of in accordance with applicable requirements by WANG Volk Field Environmental Staff to the Volk Field wastewater treatment plant under the direction of, and with approval by, the WDNR Area Engineer.
- Responsible Party

Capt. David Beck  
Volk Field Civil Engineering/Environmental Staff  
Volk Field CRTC  
Camp Douglas, WS  
Phone: (608) 427-1441

## 6.0 TANK SLUDGE MANAGEMENT

A small amount of sludge was found to be present in the bottom of each of the two USTs after removal from the ground when they were cleaned. Information regarding this sludge and its final disposition is provided below:

- Type of Sludge

Diesel tank: dirt, rust scale, and water.

Gasoline tank: dirt, rust scale, and water.

- Quantity of Sludge

Total quantity from both USTs: <50gal.

Water was decanted from the sludge and treated along with groundwater in the Volk Field wastewater treatment facility (see Section 5.0). The remainder of the dirt and rust scale was packaged and stored as waste.

- Waste Characterization Data

The waste quantity is small and will be handled and disposed of as waste to avoid the cost of characterization.

- Waste Manifests

No manifest for disposal has been prepared yet. The waste will be manifested with other hazardous waste at regular intervals, as required by Wisconsin hazardous waste regulations.

- Final Disposition of Liquids

Disposed of in accordance with applicable requirements by WANG Volk Field Environmental Staff as described in Section 5.0.

- Responsible Party

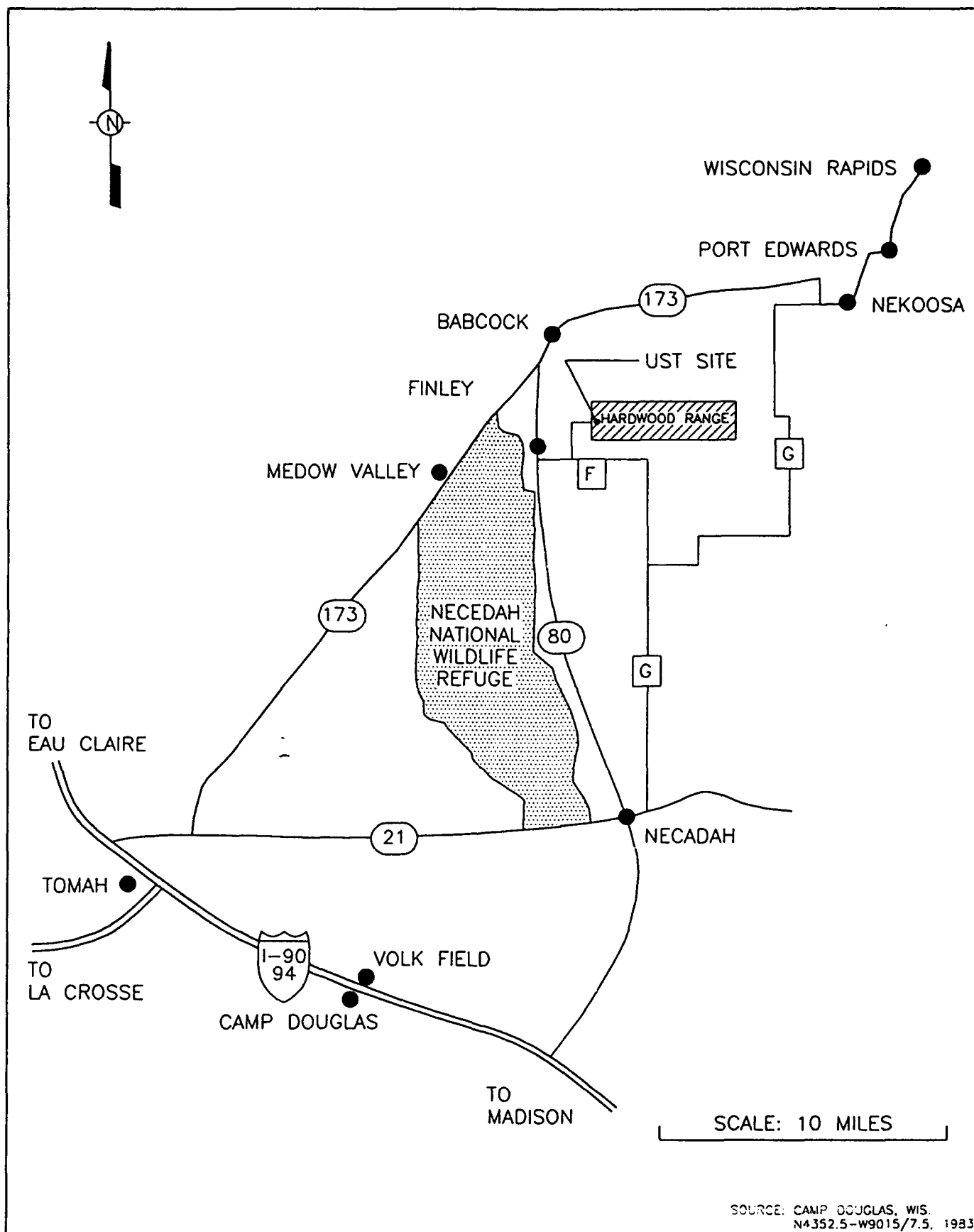
Base Civil Engineering/Environmental Staff  
Volk Field CRTC  
Camp Douglas, WS  
Phone: (608) 427-1441

## 7.0 SITE LOCATION MAP

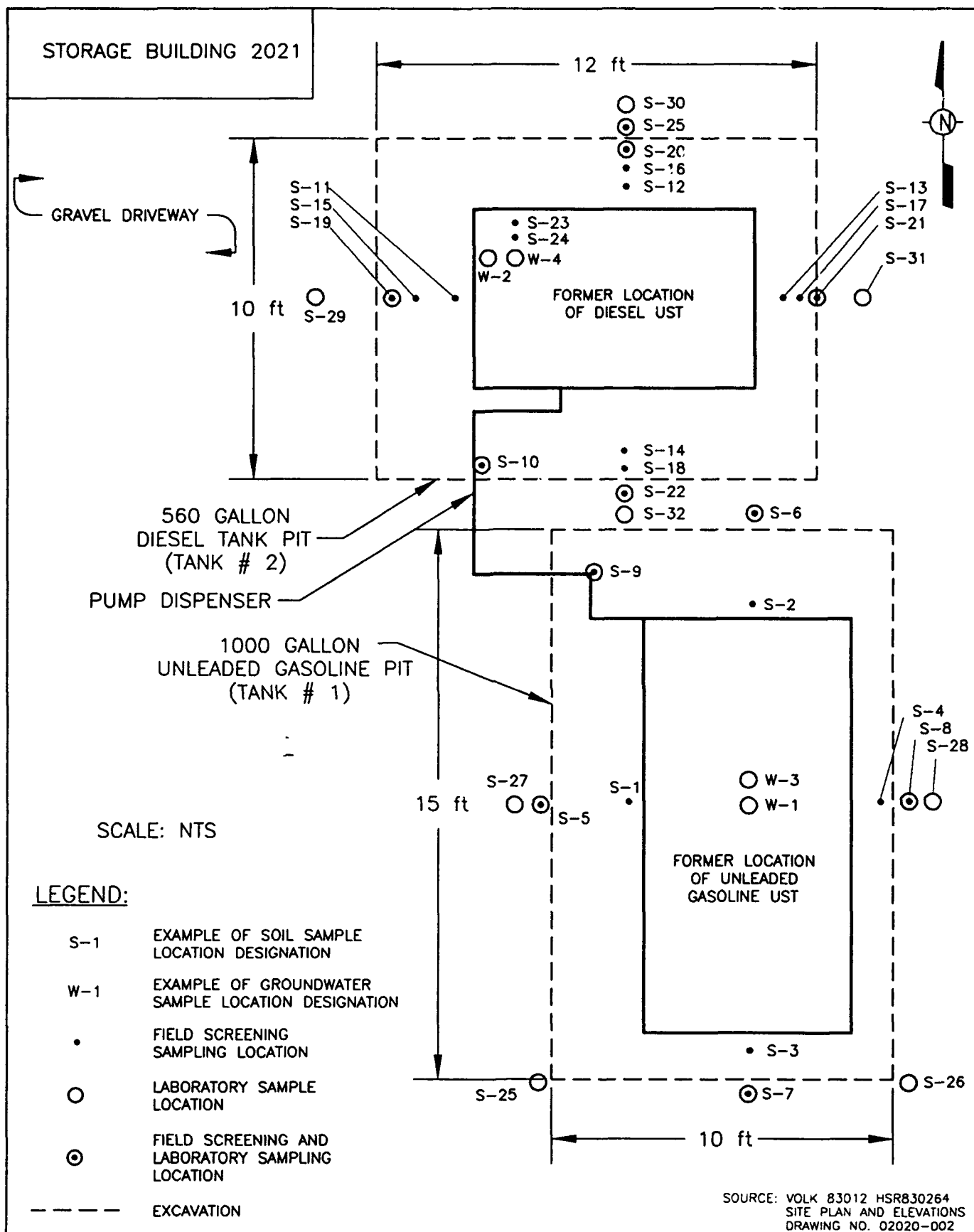
Figure 7.1 is a map showing the location of the Hardwood Range UST site relative to nearby towns and major highways.

## 8.0 SITE LAYOUT PLAN

Figure 8.1 provides a layout/plot plan of the Hardwood Range UST site with locations of the tanks, piping, dispensers, utilities, buildings, driveways, and parking areas. This figure provides a layout of each of the UST pits showing the locations of field and laboratory sampling points and other relevant data.



ADVANCED SCIENCES, INC.		FIGURE 7.1 SITE LOCATION MAP	Wisconsin Air National Guard Volk Field, Wisconsin
FILE: VOLK15	DATE: 1994		



ADVANCED SCIENCES, INC.		<b>FIGURE 8.1</b> SITE LAYOUT PLAN AND SAMPLING LOCATIONS HARDWOOD RANGE UST SITE	Wisconsin Air National Guard Volk Field, Wisconsin
FILE: VOLK14	DATE: 1994		

## 9.0 VISUAL INSPECTION

### 9.1 WEATHER

Temperature: The temperature during and prior to the site assessment was approximately 70-75°F.

Precipitation: Heavy thunderstorm previous night; approximately 1-3in of rain fell.

### 9.2 SITE CONDITIONS

Surface Staining: No trace of petroleum products was present on the soil surface above or around the UST site prior to the beginning of excavation.

Stressed Vegetation: No stressed or dead vegetation was present on or around the UST site prior to the beginning of excavation.

Other Tanks: No previously undiscovered or unregistered tanks were found during the excavation activities of the site assessment.

### 9.3 EXCAVATION

Excavation Depth: The total depth of excavation after removal of the USTs was 6-7ft.

Free Product: No free product was encountered at any time during the closure activities associated with either UST. Only a slight hydrocarbon sheen was observed to be present on top of groundwater which collected in the bottom of each pit after removal of the USTs. Groundwater was first encountered at 4ft below the ground surface during excavation activities.

Soil Type/Profile: The soil types at Hardwood Range are generally classified as marshy, sandy soils. The soils are moderately to excessively drained and have high permeabilities. The soil profile observed during the excavation of the USTs indicated that the soil at the UST site is loose, fine sand which is yellowish in color and slightly loamy due to the presence of 1-2inch lenses of dark organic matter (probably peat) to a depth of approximately 30 inches. There is no gravel in the subsoil and the amount of silt is very small (ES 1991).

Free Standing Water: Groundwater was encountered at the time of UST excavation at 4ft below the ground surface. Since the excavation pits were dug to approximately 6ft in depth, this left 2ft of free standing water in each of the pits. The groundwater encountered is assumed to be the uppermost aquifer in the area and not a perched zone since most of the terrain is boggy. No pump-out test was conducted.

## 9.4 TANK SYSTEM COMPONENTS

Condition of Tanks: The unleaded gasoline UST was removed from the ground in tact and did not appear to have any unusual amount of rust or other corrosion anywhere on the tank or associated piping. The tank was visually inspected after cleaning and was free of any holes or other leak paths big enough to see with the naked eye. No visual inspection or field screening results indicated that leakage had occurred (see Section 10.0 for field screening results). Previous leak testing had indicated that this UST was leaking (see Section 2.7).

The diesel UST was removed from the ground in tact and did not appear to have any unusual amount of rust or other corrosion anywhere on the tank or associated piping. The tank was visually inspected after cleaning and was observed to have two small holes 2-3 millimeters in diameter which penetrated completely through the wall of the tank.

Piping Condition: The piping associated with both USTs was visually inspected as it was unearthed and dismantled. All piping appeared to be in good condition with no visible signs of leakage and no contaminated soil detected by field screening under any pipe runs or elbows (refer to Table 10.1). This was verified by samples submitted for laboratory analysis (refer to Table 10.2).

Possible Leak Locations: As indicated above, possible leak locations were monitored with field screening Photoionization Detector (PID) instrumentation and no petroleum contamination was detected.

Confirmation Sampling: A laboratory confirmation sample (sample location S-9) was taken under an elbow in the piping run connecting the USTs to the pump dispenser; no elevated levels of contamination were found to be present. A confirmation sample (sample location S-10) was also taken 2–3ft under the area where the dispenser had previously been located and elevated levels of contamination were found to be present. A full list of all confirmation samples and results is provided in Section 10.0.

## 10.0 SOIL SAMPLING

### 10.1 SOIL SAMPLING DATA PRESENTATION

This section provides soil sample results and other applicable data in tabular form as required by the WDNR site assessment documentation guidance. Table 10.1 contains laboratory analytical results of confirmation samples taken at the time of excavation of the USTs on July 28, 1993 and the final set of field screening samples from each sampling location for each of the two USTs. Table 10.2 contains the laboratory analytical results of confirmation samples taken on August 9, 1993 in accordance with late site assessment procedures provided in WDNR site assessment guidance. Samples collected on August 9, 1993 did not include samples from the areas under the dispenser or piping runs due to the amount of excavation which had been performed after



**TABLE 10.1**  
**LABORATORY AND FIELD SCREENING RESULTS — SOILS**  
**DIESEL AND UNLEADED GASOLINE UST PITS**  
**HARDWOOD RANGE UST SITE, VOLK FIELD, WISCONSIN**  
**JULY 28, 1993**

Sample Number	Sample Location (Location ID—See Fig. 8-1)	Sample Depth (ft)	Soil Type	Moisture Content	Date Collected	Time Collected	Date Analyzed	Sample Odor	Field Screening Reading	Lab Results	Analysis Performed
HR-GT-SS-01 HR-GT-SS-02	South Side of Unleaded Tank (S-7)	4	Sand	Moist	07/28/93	11:30am	07/30/93 07/31/93	No	ND	<10ppm <10ppm	GRO DRO
HR-GT-SN-01 HR-GT-SN-02	North Side of Unleaded Tank (S-6)	4	Sand	Moist	07/28/93	11:30am	07/30/93 07/31/93	No	ND	<10ppm <10ppm	GRO DRO
HR-GT-SE-01 HR-GT-SE-02	East Side of Unleaded Tank (S-8)	4	Sand	Moist	07/28/93	11:30am	07/31/93 07/31/93	No	ND	<10ppm 10ppm	GRO DRO
HR-GT-SW-01 HR-GT-SW-02	West Side of Unleaded Tank (S-5)	4	Sand	Moist	07/28/93	11:30am	07/31/93 07/31/93	No	ND	<10ppm <10ppm	GRO DRO
HR-GT-SL-01 HR-GT-SL-02	Unleaded Piping Elbow (S-9)	3	Sand	Moist	07/28/93	10:10am	07/31/93 07/31/93	No	5ppm	<10ppm <10ppm	GRO DRO
HR-GT-SD-01 HR-GT-SD-02	Unleaded and Diesel Dispenser (S-10)	3	Sand	Moist	07/28/93	12:55pm	08/02/93 08/02/93	Yes	50ppm	550ppm 710ppm	GRO DRO
HR-DT-SS-01 HR-DT-SS-02	South Side of Diesel Tank (S-22)	4	Sand	Moist	07/28/93	12:55pm	08/02/93 07/31/93	No	0.7ppm	16ppm <10ppm	GRO DRO
HR-DT-SN-01 HR-DT-SN-02	North Side of Diesel Tank (S-20)	4	Sand	Moist	07/28/93	12:55pm	08/02/93 07/31/93	No	0.3ppm	<10ppm <10ppm	GRO DRO
HR-DT-SE-01 HR-DT-SE-02	East Side of Diesel Tank (S-21)	4	Sand	Moist	07/28/93	12:55pm	08/02/93 07/31/93	No	1.5ppm	<10ppm <10ppm	GRO DRO
HR-DT-SW-01 HR-DT-SW-02	West Side of Diesel Tank (S-19)	4	Sand	Moist	07/28/93	12:55pm	08/02/93 07/31/93	No	3ppm	<10ppm 11ppm	GRO DRO
HR-DT-SN-01D HR-DT-SN-02D	Duplicate from North Side of Diesel Tank (S-20)	4	Sand	Moist	07/28/93	12:55pm	08/02/93 07/31/93	No	3ppm	<10ppm <10ppm	GRO DRO

ND = Not Detected

GRO = Gasoline Range Organics

DRO = Diesel Range Organics

**TABLE 10.2**  
**LABORATORY ANALYTICAL RESULTS — SOILS**  
**DIESEL AND UNLEADED GASOLINE UST PITS**  
**HARDWOOD RANGE UST SITE, VOLK FIELD, WISCONSIN**  
**AUGUST 9, 1993**

Sample Number	Sample Location (Location ID-see Fig. 8.1)	Sample Depth (ft)	Soil Type	Moisture Content	Date Collected	Time Collected	Date Analyzed	Sample Odor	Field Screening Reading	Lab Results	Analysis Performed
HR-GT-SSE	Southeast Side of Unleaded Tank (S-26)	4	Sand	Moist	08/09/93	11:30am	08/10/93 08/11/93	No	N/A	<10ppm <10ppm	GRO DRO
HR-GT-SSW	Southwest Side of Unleaded Tank (S-25)	4	Sand	Moist	08/09/93	11:30am	08/10/93 08/11/93	No	N/A	<10ppm <10ppm	GRO DRO
HR-GT-SIE	East Side of Unleaded Tank (S-28)	4	Sand	Moist	08/09/93	11:30am	08/10/93 08/11/93	No	N/A	<10ppm <10ppm	GRO DRO
HR-GT-SW	West Side of Unleaded Tank (S-27)	4	Sand	Moist	08/09/93	11:30am	08/10/93 08/10/93	No	N/A	<10ppm <10ppm	GRO DRO
HR-DT-SS	South Side of Diesel Tank (S-32)	4	Sand	Moist	08/09/93	12:55pm	08/10/93 08/11/93	No	N/A	<10ppm <10ppm	GRO DRO
HR-DT-SN	North Side of Diesel Tank (S-30)	4	Sand	Moist	08/09/93	12:55pm	08/10/93 08/11/93	No	N/A	<10ppm <10ppm	GRO DRO
HR-DT-SE	East Side of Diesel Tank (S-31)	4	Sand	Moist	08/09/93	12:55pm	08/10/93 08/11/93	No	N/A	<10ppm <10ppm	GRO DRO
HR-DT-SW	West Side of Diesel Tank (S-29)	4	Sand	Moist	08/09/93	12:55pm	08/10/93 08/11/93	No	N/A	<10ppm <10ppm	GRO DRO
HR-DT-SS	Duplicate from South Side of Diesel Tank (S-32)	4	Sand	Moist	08/09/93	12:55pm	08/10/93 08/11/93	No	N/A	<10ppm <10ppm	GRO DRO

ND = No Detection

N/A = Not Applicable; no field screening performed

GRO = Gasoline Range Organics

DRO = Diesel Range Organics

these locations had been originally sampled (i.e., no soil was present to collect a sample other than at the very bottom of the tank pits). A discussion of factors requiring the need for late site assessment sampling are discussed in Section 13.2.

## **10.2 FIELD SCREENING RESULTS**

Table 10.3 contains field screening data which is keyed to sampling locations shown in Figure 8.1. The final set of field screening data for locations from which a laboratory confirmation sample was taken are also presented in Table 10.1 so that the field screening reading can be readily compared with the corresponding laboratory analysis results.

During field screening, the need to continue excavating around the tanks was determined from headspace analyses using a PID. The soil was determined "clean" if the organic vapor concentrations were below the 5.0ppm requirement established by the WDNR North Central District. If readings were above the 5.0 ppm, excavation continued until the PID readings indicated organic vapor concentrations to be below 5.0ppm.

The samples collected for laboratory confirmation were analyzed for both gasoline range organics (GRO) and diesel range organics (DRO). The confirmation of "clean" soil was established based on the analytical results being < 10ppm for GRO and < 10ppm for DRO.

### **10.2.1 FIELD SCREENING - GASOLINE UST**

Two sets of field screening data were collected from the four sides of the 1,000gal gasoline tank. The first set of field screening data were obtained from samples collected at sample locations S-1, S-2, S-3, and S-4. No fuel odor was detected in any of the samples. Two of the samples, S-2 and S-3, contained concentrations detected by the PID. However, both detections were at or lower than the 5ppm threshold limit.

The second set of field screening data for the gasoline tank were provided by samples collected at locations S-5, S-6, S-7, and S-8. Fuel odor was not detected in either sample; also, the PID did not detect any reading. Therefore, the soil was considered to be "clean" around the gasoline tank based on the PID readings of the second set of field screening data.

### **10.2.2 FIELD SCREENING - DIESEL UST**

Three sets of field screening data were collected from the four sides of the diesel tank before the soil could be considered clean. The first set of field screening data were obtained from samples collected from sample locations S-11, S-12, S-13, and S-14. Fuel odor was detected in samples obtained from locations S-11 and S-14. The PID, used to screen the soil samples, detected organic vapors at or above 5.0 ppm in all four samples. Based on the screening results, a decision was made to excavate an additional one foot of soil from each side of the tank pit. Samples were obtained from locations S-15, S-16, S-17, and S-18, and screened with the PID. The PID detected organic vapors above 5.0ppm in all four samples. Fuel odor was also noticed in all four samples. Based on the second set of screening data, a decision was made to excavate

**TABLE 10.3**  
**FIELD SCREENING RESULTS - SOILS**  
**Diesel and Unleaded Gasoline UST Pits Hardwood Range UST Site, Volk Field, Wisconsin**

Sample Location ID (on Fig. 8.1)	Sample Location	Sample Depth, ft	Soil Type	Moisture Content	Date Collected	Time Collected	Sample Odor	Field Screening Reading with PID, ppm (u.) <sup>1</sup>
S-1	West side of unleaded UST	3	Sand	Moist	7/28/93	9:00 AM	No	ND <sup>2</sup>
S-2	North side of unleaded	6	Sand	Moist	7/28/93	10:00 AM	No	5.0
S-3	South side of unleaded	6	Sand	Moist	7/28/93	10:20 AM	No	0.7
S-4	East side of unleaded UST	6	Sand	Moist	7/28/93	11:10 AM	No	ND
S-5	West side of unleaded UST	4	Sand	Moist	7/28/93	11:30 AM	No	ND
S-6	North side of unleaded	4	Sand	Moist	7/28/93	11:30 AM	No	ND
S-7	South side of unleaded	4	Sand	Moist	7/28/93	11:30 AM	No	ND
S-8	East side of unleaded UST	4	Sand	Moist	7/28/93	11:30 AM	No	ND
S-9	Unleaded piping elbow	3	Sand	Moist	7/28/93	10:10 AM	No	ND
S-10	Under dispenser	3	Sand	Moist	7/28/93	12:55 PM	Yes	50
S-11	West side of diesel UST	2	Sand	Moist	7/28/93	12:25 PM	Yes	20
S-12	North side of diesel UST	3	Sand	Moist	7/28/93	12:40 PM	No	2.0
S-13	East side of diesel UST	6	Sand	Moist	7/28/93	1:15 PM	No	5.0
S-14	South side of diesel UST	6	Sand	Moist	7/28/93	1:30 PM	Yes	30
S-15	West side of diesel UST	4	Sand	Moist	7/28/93	2:00 PM	Yes	25
S-16	North side of diesel UST	4	Sand	Moist	7/28/93	2:00 PM	Yes	75
S-17	East side of diesel UST	4	Sand	Moist	7/28/93	2:00 PM	Yes	15
S-18	South side of diesel UST	4	Sand	Moist	7/28/93	2:00 PM	Yes	40
S-19	West side of diesel UST	4	Sand	Moist	7/28/93	3:30 PM	No	3.0
S-20	North side of diesel UST	4	Sand	Moist	7/28/93	3:30 PM	No	0.3
S-21	East side of diesel UST	4	Sand	Moist	7/28/93	3:30 PM	No	1.5
S-22	South side of diesel UST	4	Sand	Moist	7/28/93	3:30 PM	No	0.7
S-23	Mud-bottom of diesel pit	6	Sand	Wet	7/28/93	3:30 PM	Yes	25
S-24	Mud-bottom of diesel pit	6	Sand	Wet	7/28/93	3:30 PM	Yes	15

<sup>1</sup> i.u. = instrument units as isobutylene

<sup>2</sup> ND = Not Detected

an additional one foot of soil from each side of the tank pit. Samples were obtained from locations S-19, S-20, S-21, and S-22, and screened with the PID. Fuel odor was not noticed in any of the samples, and the PID detected organic vapors below 5.0ppm in all four samples. Based on the third set of screening data, it was determined that additional excavation of the diesel pit was not necessary.

Field screening samples were collected within a foot of each other.

## **11.0 GROUNDWATER SAMPLING**

As stated in the work plan (ASI 1993), if groundwater was encountered, a sample would be collected for laboratory analyses. The water table was encountered four to five feet below the ground surface during the excavation of the tanks. Approximately two feet of water collected in the tank pits. Groundwater samples were collected from sample locations W-2 and W-4 for the diesel tank and from sample locations W-1 and W-3 for the gasoline tank. Refer to Table 10.4 for analytical results and Figure 8.1 for sample locations.

## **12.0 LABORATORY REPORTS**

Laboratory reports containing the results of analysis of the confirmation samples by the Wisconsin certified laboratory are provided in Appendices B and C. The reports are a modified version of the WDNR standard form recommended for use in the site assessment guidance.

## **13.0 DISCUSSION**

This section provides a narrative describing the results of the site assessment. The chronology of events involved with the entire site assessment is provided, with discussion and explanation included where necessary to explain the significance of any unusual situations.

### **13.1 SITE ASSESSMENT CHRONOLOGY**

Site assessment field activities are intended to confirm or deny the presence of petroleum hydrocarbon contamination at the time of UST removal. This was accomplished at the Hardwood Range UST site through the screening of soil samples by use of visual examination for gross heavy hydrocarbon contamination and the use of a PID for detecting the presence of volatile organic compounds. The soil screening was done as the soil was removed during the UST excavation. As contamination was found, additional screening was done as the pit was excavated outward. As specified in the work plan for this site assessment, excavation would continue as

**TABLE 10.4**  
**LABORATORY ANALYTICAL RESULTS - GROUNDWATER**  
**DIESEL AND UNLEADED GASOLINE UST PITS**  
**HARDWOOD PUMP UST SITE, VOLK FIELD, WISCONSIN**

	Enforcement Standard (ppb)	Preventative Action Limit (ppb)	July 28, 1993		August 9, 1993	
			Sample No./Location No. <sup>2</sup>			
			HR-GT-WB/W-1	HR-DT-WB/W-2	HR-GT-WB/W-3	HR-DT-WB/W-4
VOCs						
Benzene	5	0.067	ND	ND	ND	ND
Ethylbenzene	1360	272	ND	3.0	ND	ND
Methyl-tertiary-butyl ether	60	12	ND	ND	ND	ND
Toluene	343	68.6	ND	3.9	ND	ND
1,2,4-trimethylbenzene	-	-	ND	13	ND	ND
1,3,5-trimethylbenzene	-	-	5.6	11	ND	ND
m-xylene + p-xylene <sup>1</sup>	620	124	ND	10	ND	ND
o-xylene	620	124	3.2	10	ND	ND
PAHs						
Acenaphthene	-	-	ND	ND	ND	ND
Acenaphthylene	-	-	ND	ND	ND	ND
Anthracene	-	-	ND	ND	ND	ND
Benzo(a)anthracene	-	-	ND	1.2	ND	ND
Benzo(a)pyrene	0.003	0.0003	ND	ND	ND	ND
Benzo(b)fluoranthene	-	-	ND	ND	ND	ND
Benzo(g,h,i)perylene	-	-	ND	ND	ND	ND
Benzo(k)fluoranthene	-	-	ND	ND	ND	ND
Chrysene	-	-	ND	ND	ND	ND
Dibenzo(a,h)anthracene	-	-	ND	ND	ND	ND
Fluoranthene	-	-	ND	ND	ND	ND
Fluorene	-	-	ND	4.0	ND	ND

TABLE 10.4 (Continued)

TABLE 10.4 LABORATORY ANALYTICAL RESULTS - GROUNDWATER DIESEL AND UNLEADED GASOLINE UST PITS HARDWOOD PUMP UST SITE, VOLK FIELD, WISCONSIN						
	Enforcement Standard (ppb)	Preventative Action Limit (ppb)	July 28, 1993		August 9, 1993	
			Sample No./Location No. <sup>2</sup>			
			HR-GT-WB/W-1	HR-DT-WB/W-2	HR-GT-WB/W-3	HR-DT-WB/W-4
PAHs (Continued)						
Indeno(1,2,3-cd)pyrene	-	-	ND	ND	ND	ND
1-methyl naphthalene	-	-	ND	ND	ND	ND
2-methyl naphthalene	-	-	ND	ND	ND	ND
Naphthalene	40	8	ND	ND	ND	ND
Phenanthrene	-	-	ND	1.4	ND	ND
Pyrene	-	-	ND	4.5	ND	ND

<sup>1</sup> Laboratory reported m-xylene and p-xylene as one combined number; o-xylene concentration provided separately by laboratory.

<sup>2</sup> See Figure 8.1 for location of samples.

long as contamination was still present up to a maximum of 5ft beyond the original limits of the UST walls. Below is a chronology of site assessment activities which were performed during excavation of the two USTs:

#### Site Assessment of Unleaded Gasoline UST

- Began excavation of soil above and around the unleaded gasoline UST; site assessor performed field screening of excavated soils (see Table 10.3).
- Groundwater was encountered at approximately 4ft below ground surface as excavation progressed. Groundwater collected in a pool in the bottom of the pit approximately 1-2ft deep.
- Samples were taken for laboratory analysis as required by regulatory guidance which included a sample from under a piping elbow and from under the former location of the single pump dispenser for both USTs which was located between the two USTs.
- Unleaded gasoline UST was removed from the pit; screening samples were taken from walls of the pit; results indicated no significant residual volatile organic compounds in the soils; laboratory confirmation soil samples were taken from the walls of the pit [samples were collected from the backhoe in accordance with the work plan (ASI 1993) and with the WDNR Site Assessment Guidance] and a sample of the groundwater was also collected; the groundwater sample was collected from the bottom of the pit; no further excavation or sampling in the unleaded gasoline pit was performed.
- The contaminated soil which was excavated was placed on plastic. The clean soil was stockpiled for use as backfill.

#### Site Assessment of Diesel UST

- Began excavation of soil above and around the diesel UST; site assessor performed field screening of excavated soils (see Table 10.3).
- Groundwater encountered at approximately 4ft below ground surface as excavation progressed. Groundwater collected in a pool in the bottom of the pit approximately 1-2ft deep.
- Diesel UST was removed from pit; screening samples were taken from the four walls of the pit. Results of the first set of samples indicated significant residual volatile organic compounds in the soils. Approximately one foot of soil was excavated and a second set of samples were collected, one from each of the four sides of the tank pit. The second set of samples also indicated residual volatile organic compounds in the soil. After excavating another one foot of soil from all sides of the tank pit, a third set of soil samples were collected. None of the results from the third set of samples indicated significant residual volatile organic compounds in the soil. Confirmation samples were taken from the four walls of the pit and a sample of the groundwater was also collected;



a groundwater sample was collected from bottom of pit; no further excavation or sampling in the diesel pit was performed after the collection of the third set of samples.

- The excavated soil was stockpiled. The contaminated soil was placed on plastic and the clean soil stockpiled for use as backfill.

As indicated in the chronology of site assessment activities listed above, when the maximum extent of the excavation was reached in each pit, a set of soil samples was taken from the four walls of the pits just above the surface of the groundwater which accumulated in the pits. This is in accordance with procedures specified in WDNR regulatory guidance documents when groundwater is encountered during site assessment UST excavation activities (WDNR, 1992). The purpose of the confirmation samples is either to confirm that no contamination is present at the farthest extent of excavation or to characterize the contamination that is found. In both UST pits no contamination was detected by field screening at the farthest extent of excavation, and the samples taken were of the confirmation type.

### 13.2 LATE SITE ASSESSMENT EVALUATION

Although field screening samples were taken at the time of the UST excavations, the confirmation samples collected on July 28, 1993 were not adequately packaged and preserved at the time the samples were taken. For this reason the analytical results from these samples were considered to be potentially invalid and sampling was repeated twelve days (August 9, 1993) later in accordance with guidance specified by WDNR for "Late Site Assessments". Samples were taken the second time by coring beneath the soil surface into the wall of the tank pits just above the surface of groundwater in the bottom of the pit to a depth of approximately 1ft in order to obtain undisturbed soil sample materials. The analytical results of confirmation sampling done both on the day of UST excavations as well as that done at the later date are provided in Tables 10.1 and 10.2, respectively. Table 10.1 also includes the results of other samples required by regulatory guidance which include a sample from under a piping elbow and from under the gasoline and diesel pump island where one dispenser for both tanks was located. Field screening data and laboratory analytical results of the confirmation samples are discussed below.

### 13.3 DISCUSSION OF DATA

- Even though soils samples collected on July 28, 1993 were improperly packaged and preserved, which would tend to allow volatile components to escape or degrade, the laboratory results indicate levels of contamination consistent with field screening results obtained at the time of UST excavation (see Table 10.1 columns for "Field Screening Results" and "Lab Results"). Consistency between field screening and laboratory samples is also seen in the one "dirty" sample location (S-10) associated with the soil directly under the pump island dispenser where elevated levels of contaminants were found in both field and laboratory confirmation samples. The field screening reading for sample

location S-10 was 50ppm and the laboratory analytical results were 550ppm for the gasoline range organics analysis and 710ppm for the diesel range organics analysis.

- Both sets of laboratory results (July 28 and August 9) indicate very similar levels of contaminants. Contamination levels are predominantly below detection limits, with a small number of samples from July 28 being at, or slightly above, detection limits (See Table 10.1).
- The analytical results of the groundwater samples collected from the tank pits indicated that many of the volatile organic compounds and polynuclear aromatic hydrocarbons were not detected (see Table 10.4). For those contaminants which were detected, the concentrations were far below the Wisconsin standards or action limits requiring the need for remediation.

### **13.4 RELEASE DETERMINATION AND CONCLUSIONS**

Based on the results of analytical testing performed on samples from the Hardwood Range UST site, it can be concluded that a release did occur from the diesel UST. However, the level of contamination in the field screening and laboratory confirmation samples indicates that the petroleum-affected soil was confined to the immediate vicinity of the tank pits and that all affected soil was removed during UST removal and site assessment activities of July 28 and August 9, 1993.

## **14.0 SUPPORTING DOCUMENTATION AND INFORMATION**

Supporting documentation and information have been placed into the following appendices:

- Appendix A contains the work plan — Underground Storage Tank Closure Assessment Work Plan. The work plan details the standard sample collection procedures.
- Appendix B contains a copy of laboratory reports for the soil samples collected July 28, 1993. The appendix also contains the results of the groundwater samples and the chain-of-custody forms.
- Appendix C contains a copy of laboratory reports for soil and groundwater samples collected August 9, 1993. The chain-of-custody forms are also included.
- Appendix D contains the copies of the tank inventory forms and the checklists for tank closure.

## 15.0 REFERENCES

Advanced Sciences, Inc. (ASI), "Underground Storage Tank Closure Assessment Work Plan, Hardwood Range, Wisconsin Air National Guard, Volk Field, Camp Douglas, Wisconsin," January 1993.

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**Closure Assessment Work Plan**

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# INSTALLATION RESTORATION PROGRAM

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WISCONSIN AIR NATIONAL GUARD  
VOLK FIELD  
CAMP DOUGLAS, WISCONSIN

## UNDERGROUND STORAGE TANK CLOSURE ASSESSMENT WORK PLAN HARDWOOD RANGE

JANUARY 1993



Hazardous Waste Remedial Action Program  
Oak Ridge, Tennessee 37831-7606  
Managed by MARTIN MARIETTA ENERGY SYSTEMS, INC.  
For the U.S. DEPARTMENT OF ENERGY under contract DE-AC05-84OR21400

**RAPID RESPONSE INITIATIVE  
UNDERGROUND STORAGE TANK INVESTIGATIONS**

**UNDERGROUND STORAGE TANK  
CLOSURE ASSESSMENT  
WORK PLAN**

**WISCONSIN AIR NATIONAL GUARD  
VOLK FIELD  
CAMP DOUGLAS, WISCONSIN**

**OCTOBER 1992**

*Prepared For:*

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*Submitted by:*

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## **List of Acronyms**

ASI	Advanced Sciences, Inc.
ASTM	American Society for Testing Materials
CO	Contracting Officer
COC	Chain of Custody
CRTC	Combat Readiness Training Center
DOE	Department of Energy
HAZWRAP	Hazardous Waste Remedial Action Program
IAG	Interagency Agreement
IRP	Installation Restoration Program
MS/MSD	matrix spike/matrix spike duplicate
NGB	National Guard Bureau
OSHA	Occupational, Safety and Health Administration
PID	photoionization detector
RI	remedial investigation
RRI	Rapid Response Initiative
SA	site assessment
UST	underground storage tank
VOA	volatile organic analysis
VOC	volatile organic compound
WANG	Wisconsin Air National Guard
WDNR	Wisconsin Department of Natural Resources

## **1. INTRODUCTION**

### **1.1 BACKGROUND**

This Work Plan outlines underground storage tank (UST) closure assessment activities to be conducted at the Hardwood Range, which is a facility operated by the Wisconsin Air National Guard, Volk Field Combat Readiness Training Center (CRTC). The objectives of the assessment are to determine the extent of UST backfill soil requiring excavation, to provide documentation of soil and water conditions following excavation, and to support closure in accordance with applicable State of Wisconsin regulations.

The National Guard Bureau (NGB) has developed the Rapid Response Initiative (RRI) to conduct site assessments, evaluate potential corrective actions, and design the selected remedies at leaking UST and spill sites at Air National Guard facilities. The U.S. Department of Energy (DOE), through an existing Interagency Agreement (IAG) with the Air Force, provides technical assistance in implementing the RRI for the NGB. Martin Marietta Energy Systems, Inc. was assigned the responsibility of managing the Hazardous Waste Remedial Action Program (HAZWRAP) for DOE. This Work Plan was prepared by Advanced Sciences, Inc. (ASI), under the direction of HAZWRAP.

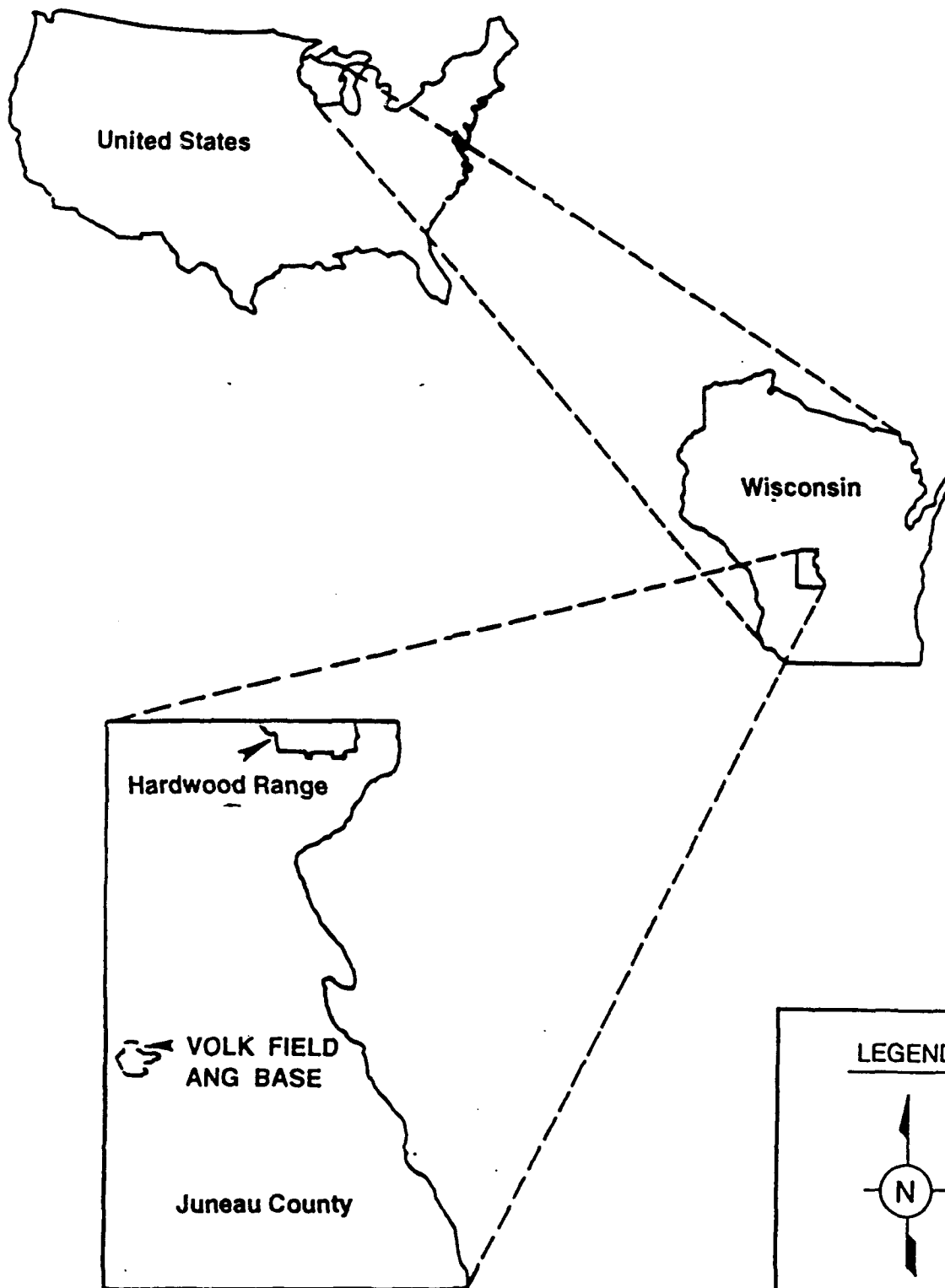
No prior investigations have been conducted at the Hardwood Range UST site. Investigations which have been conducted elsewhere at the Hardwood Range Facility as part of the Installation Restoration Program (IRP) are discussed in Section 2.0.

### **1.2 FACILITY DESCRIPTION**

Hardwood Range Facility consists of 7300 acres that lie approximately 110 miles northwest of Madison in Juneau County, Wisconsin (Fig.1.1). Because the Facility is used for bombing and gunnery exercises, it is in a relatively isolated and sparsely populated area. Structures at the Facility include three observation towers and support buildings at one of the tower locations. Otherwise the Facility consists of undeveloped land with unpaved roads leading to various bombing and gunnery impact areas (Fig.1.2).

### **1.3 SITE DESCRIPTION**

The Hardwood Range UST site consists of two inactive 500-gal USTs—one contained unleaded gasoline and the other contained diesel fuel. The two USTs are located in a gravel parking area approximately 40ft from the nearest structure as shown in Fig.1.3. A very small shed, associated with the above-ground fuel dispensing equipment, is directly over the site where the USTs are buried. An electric power line extends from Building 2021 to the USTs for the pump power supply. No further information about any utilities or piping adjacent to the UST site is available.



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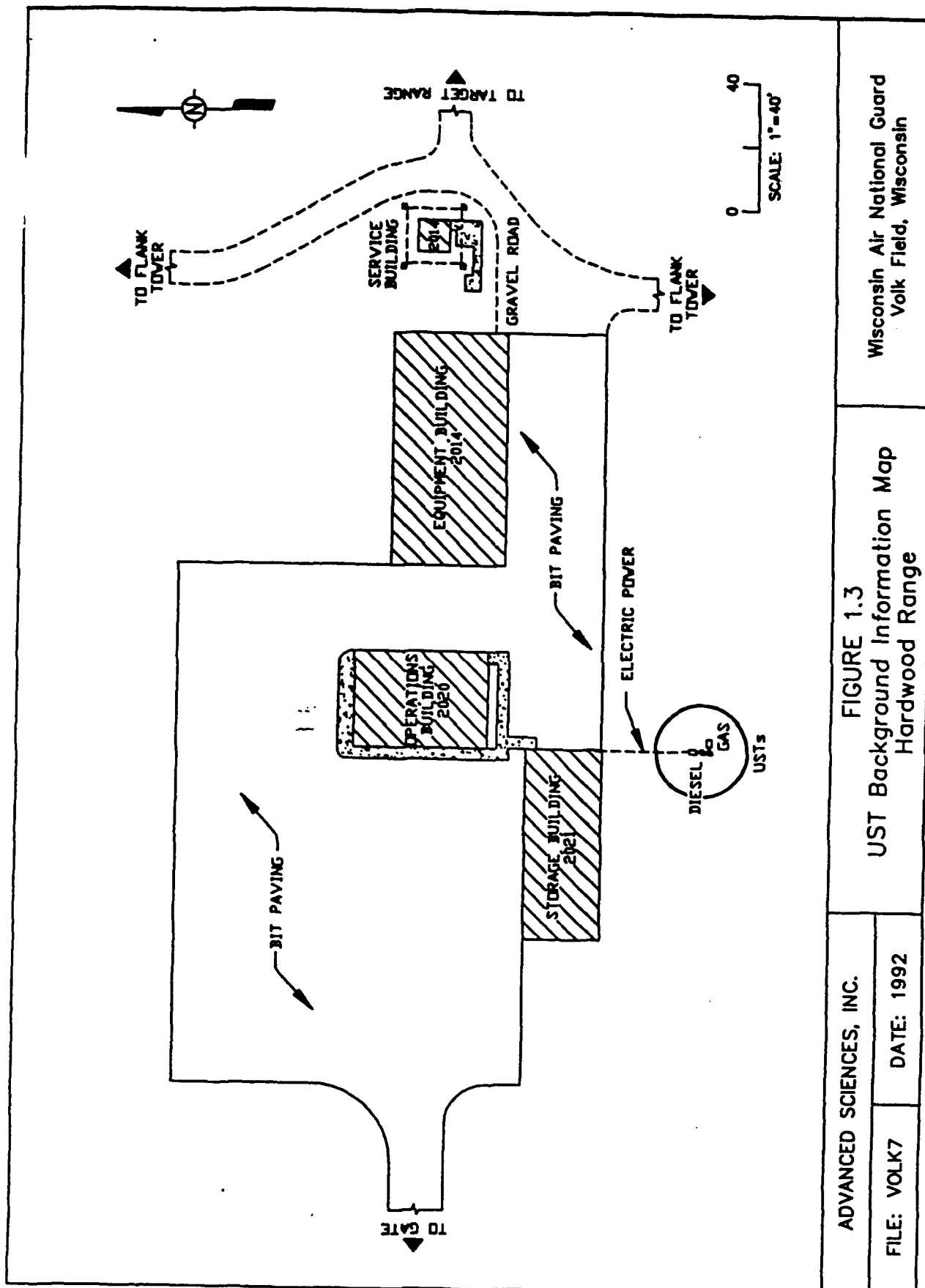
FILE: VOLK10

DATE: 1992

FIGURE 1.1  
FACILITY LOCATION MAP

**WANG BASE**  
Combat Readiness Training Center  
Volk Field, Wisconsin





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FILE: VOLK7

DATE: 1992

FIGURE 1.3  
UST Background Information Map  
Hardwood Range

Wisconsin Air National Guard  
Volk Field, Wisconsin

## **2.0 SITE ASSESSMENT HISTORY**

### **2.1 OTHER SITE INVESTIGATIONS**

An IRP remedial investigation (RI) activity was performed during 1991 at a munitions burial site located on the southwest side of Hardwood Range, approximately 1600ft south-southwest of the UST site. The results from these RI activities are not directly applicable to the activities being conducted on the USTs in this Work Plan. However, the installation of a groundwater monitoring well at the IRP site provides information about subsurface conditions in the area of the UST site. There has been no preliminary assessment performed on the UST site or any other area of the Hardwood Range Facility.

### **2.2 TANK AND PIPING TIGHTNESS TESTING**

Tightness testing performed by a contractor on the 500-gal diesel UST on Oct. 31, 1991 indicated that it was not leaking. This testing was done in accordance with National Fire Protection Association (NFPA) Method 329 criteria with the tank 58% full of fluid. The leak testing data indicated at that time that the UST was in compliance with leak tightness criteria of NFPA Method 329. The 500-gal gasoline UST has previously been suspected of receiving leakage from groundwater (and/or seepage from run-off) and may be partially filled with water. Therefore, no leak testing has been conducted on this UST and it is scheduled for removal. No previous tightness test information for this gasoline tank is available at the time of preparation of this Work Plan.

### **3. CLOSURE ASSESSMENT PLAN**

#### **3.1 REGULATORY GUIDANCE**

##### **3.1.1 Applicable Regulations**

Site assessments must comply with requirements of federal or more stringent state or local environmental laws applicable to the site.

The activities specified in this Work Plan are intended primarily to satisfy requirements of the State of Wisconsin's Department of Industry, Labor, and Human Relations Code, ILHR Chapter 10, which relates to Flammable and Combustible Liquids. In particular, this Work Plan is intended to meet the requirements of Appendix B of the ILHR Chapter 10 Code: "Site Assessments for Underground Storage Tanks" (Appendix A). Other additional authority is included in the following State regulatory requirements:

- Wisconsin General and Portable Source Air Pollution Control Rules (Wisconsin Administrative Code, DNR 400, 401, 403, 406-410, 490-494);
- Wisconsin Nonpoint Source Pollution Rules (Wisconsin Administrative Code, DNR, Chapter 120);
- Wisconsin Drinking Water Standards (Wisconsin Administrative Code, DNR, Chapter 140);
- Contingency Plan for Emergency Actions in Response to the Discharge of Hazardous Substances (Wisconsin Administrative Code, DNR, Chapter 58); and
- Laboratory Certification and Registration (Wisconsin Administrative Code NR 149).

The activities specified in this Work Plan will comply with any additional requirements of Federal laws and regulations. These laws and regulations include the Resource Conservation and Recovery Act (RCRA); UST Regulations (40CFR280); and RCRA Land Disposal Restrictions and Treatment Standards (40CFR268); Clean Water Act's Ambient Water Quality Criteria (CWA Part 304, 1986); Safe Drinking Water Act Maximum Contaminant Levels and Maximum Contaminant Level Goals; Clean Air Act; and the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits and Short-Term Exposure Limits for Workers (29CFR1910.120).

##### **3.1.2 Soil**

As part of regulatory guidance, the Wisconsin Department of Natural Resources (WDNR) has specified contamination limits related to soils derived from site assessment activities. The North Central District of WDNR (in which the Hardwood Range is located) requires that any soils exceeding 5ppm total petroleum hydrocarbons (TPH) must be considered for remedial action (WDNR, 1991a and 1991b).

##### **3.1.3 Groundwater**

Any groundwater contamination, resulting from leaking USTs, that exceeds Wisconsin Administrative Code NR 140 specifications must be addressed for remedial action (Table 3.1).



**Table 3.1. Wisconsin Regulatory Threshold Values  
for Contaminants of Concern at Hardwood Range UST Site**

Groundwater Contaminant	Regulatory Threshold Value (in ppb)
Benzene	5
Toluene	343
Ethylbenzene	1360
Xylenes	620
Cadmium	10
Lead	50

#### 3.1.4 Free Product

State of Wisconsin regulatory guidance specifies immediate removal of free product, if it is encountered, in accordance with 40CFR280.64.

### 3.2 OBJECTIVES

Two adjacent inactive 500-gal USTs are located at Hardwood Range, one of which is suspected of leaking. Due to the permanent inactive status of both USTs, the site is to undergo closure under current Wisconsin UST regulations, which in this case will involve removal of both USTs. The objective of this Closure Assessment Work Plan, therefore, is to confirm or deny the presence of petroleum hydrocarbon contamination at the time of UST removal. If contamination is found in the soils beyond the immediate tank and piping excavation area, further investigation to determine the extent of this contamination will be specified in a subsequent Site Assessment (SA) Work Plan. Information obtained from the subsequent site assessment will be used to support corrective action activities and eventual closure of the Hardwood Range UST site, if that is not possible under this Work Plan. This Work Plan will only address activities to be conducted up to the point at which a decision will be made as to whether corrective action will be necessary.

### 3.3 CLOSURE ASSESSMENT SCOPE AND APPROACH

#### 3.3.1 Scope

The closure assessment activities in this Work Plan will be performed in conjunction with the activities specified for the UST removal contractor in the Tank Removal Plans and Specifications prepared by ASI for the Hardwood Range UST site (ASI, 1992). The scope of services to be performed by ASI during this closure assessment are:

- Providing assistance to the Contracting Officer (CO) or designee in supervising the removal of any free product still present in the USTs;

- Providing assistance to the CO or designee in supervising the removal of the USTs and associated piping;
- Collection of soil samples from the excavation pit for field screening purposes;
- Collection of a water sample (if water is present) from the UST excavation for laboratory analysis;
- Collection of soil samples from the excavation pit for laboratory analysis;
- Contracting an analytical laboratory to perform analysis of the soil and groundwater samples and submitting the samples to the laboratory;
- Providing assistance to the CO or designee in supervising the backfilling of the UST excavations; and
- Preparation of a report that contains the findings and conclusion of the UST closure assessment.

### 3.3.2 Approach and Assumptions

The field investigation of this Closure Assessment Work Plan is intended to confirm or deny the presence of petroleum hydrocarbon contamination at the time of UST removal at the Hardwood Range site. This will be accomplished through the screening of soil samples by use of visual examination for gross heavy hydrocarbon contamination and the use of a photoionization detector for detecting the presence of volatile organic compounds. The soil screening will be done as the soil is removed during the UST excavation. As contamination is found, additional screening will take place as the pit is excavated outward to a maximum of 5ft beyond the original limits of the UST walls. Contamination detected beyond this point will be addressed by a subsequent site SA. When the maximum extent of the excavation has been reached, a set of soil samples will be taken from all four walls and the bottom of the pit as specified in WDNR regulatory guidance documents (WDNR 1991a). This sampling will be used either to confirm that no contamination is present at the farthest extent of excavation or to characterize the contamination that is found to be present. These soil samples will be analyzed for purgeable organics by an environmental laboratory which has been certified under NR 149 (Wisconsin Administrative Code). The soil samples will be analyzed using methods approved by the WDNR in accordance with all regulatory requirements.

If groundwater is encountered, it will be sampled and analyzed by the same environmental laboratory under the same regulatory criteria as soil sample analysis.

No previous investigations or evidence of spills or leaks have occurred at the Hardwood Range UST site. No soil borings or monitoring wells will be installed as part of this Closure Assessment; the need for or specification of these items will be addressed in the future SA Work Plan, if it is necessary.

### 3.3.3 Chronology and Rationale

The Closure Assessment activities will begin with a review of the site specific Health and Safety Plan, a safety briefing, and a site inspection. Decontamination areas will be established. Soil screening will be conducted as soon as excavation begins and will be continued at regular intervals until the maximum extent of excavation is reached. At that time, a set of confirmatory soil samples will be collected for laboratory analysis. If soil screening does not indicate the presence of contamination, confirmatory samples will be taken as described in Section 3.4.1. The excavated pit will then be backfilled with clean soil and borrow material as needed. If soil screening does not indicate that the site can be considered clean before the 5-ft excavation limit is reached, no backfilling will be done. In this case, the pit and all excavated soils will be covered and confirmatory samples will be taken for contaminant characterization. The site will then be secured until it is investigated further by the SA.

This Closure Assessment is intended to serve only as a UST removal/closure plan in which a determination is made as to whether the site is clean or will require further corrective action.

### **3.3.4 Contingencies**

As with any field investigation, variables exist that may affect the course of planned activities as specified in this work plan. This is particularly true in the case of these closure assessment activities since it is likely that groundwater and/or free product will be encountered. If free product is encountered, it will immediately be pumped by the contractor into appropriate containers in accordance with regulations specified in Section 3.1.4.

Close coordination will be maintained between all groups involved (ANGR/CEVR, HAZWRAP, Base personnel and ASI) in order to accomplish the closure assessment in a most economic and expeditious manner while complying with all federal, state and local requirements.

## **3.4 FIELD METHODS**

### **3.4.1 Soil Assessment**

Soil samples taken from the UST area during the excavation are of two types: (1) those for screening purposes, and (2) those for laboratory confirmatory analysis purposes. The sampling activities, contaminants of concern, and analytical methods are summarized in Table 3.2. These are all in accordance with approved procedures and analytical methods as specified in Wisconsin regulatory guidance (WDNR 1991a and 1991c). During the closure assessment activities, the ASI site manager, in consultation with the HAZWRAP project manager, will determine if a background soil sample is necessary.

#### **3.4.1.1 Soil Borings**

This closure assessment will not include taking soil borings. According to WDNR regulatory guidance (WDNR 1991a), contamination that extends more than 5ft from the tanks or beyond the limits of tank pad materials requires borings, backhoe pits, trenches, soil gas surveys, or other methods to be used (to determine the extent of contamination) before proceeding with additional excavation. The need for these items will be determined by this Closure Assessment, but their implementation will be accomplished under a future SA. A maximum 5-ft range of excavation from the sides of each UST is, therefore, designated for the tank removals at the Hardwood Range site. Unless the extent of contamination is observed (and confirmed by analytical results) to be beyond the perimeter of the excavation, additional borings or other soils sampling will not be necessary, and the site will be considered closed.

#### **3.4.1.2 Soil Sampling**

Based on the WDNR regulatory guidance (WDNR 1991a), laboratory confirmatory samples will be taken as part of closure assessment soil sampling activities. Samples from the walls and base of the pit will be taken by obtaining material from the backhoe bucket when soils from the walls and base are being removed. No entry into the excavation pit will be made by the personnel at the site.

All samples will be collected and subsequently handled in accordance with all applicable Federal, State and local regulations.

**TABLE 3.2**  
**Summary of Site Assessment Sampling Activity**

LOCATION	FIELD ACTIVITIES		MATERIALS OF CONCERN	MEDIA ANALYSIS METHOD	
	SCREENING	CONFIRMATION		GROUNDWATER	SOIL
<p>Hardwood Range 500 gal Diesel Tank</p> <p>500 gal Gasoline Tank (both tanks will be analyzed for the same contaminants due to the close proximity of the tanks and the possibility for mixing of contents)</p>	<p>PID Headspace Scan of Soil exposed during excavation at 15ft<sup>3</sup> intervals.</p>	<ul style="list-style-type: none"> <li>• Samples will be taken from the walls of the pit</li> <li>• Samples will be taken from the base of the pit and along piping runs</li> <li>• One background sample away from the UST site, if necessary</li> <li>• Laboratory analysis of these soil samples</li> <li>• Collect one groundwater sample if groundwater encountered.</li> <li>• Laboratory analysis of the groundwater sample</li> </ul>	<p>Diesel, Gasoline</p>	<ul style="list-style-type: none"> <li>• VOC-8240</li> <li>• GRO/DRO(TRPH)-9073 or 418.1</li> <li>• Pb-3010/6010 or 3020/7421</li> </ul>	<ul style="list-style-type: none"> <li>• VOC-8240</li> <li>• GRO/DRO(TRPH)-9073 or 418.1</li> <li>• Pb-3010/6010 or 3020/7421</li> </ul>

**Definitions:**

GRO - Gasoline Range Organics

DRO - Diesel Range Organics

TRPH - Total Recoverable Petroleum Hydrocarbons (GRO + DRO = TRPH)

Pb - Total dissolved lead

VOC - Volatile Organic Compounds (includes BTEX: Benzene, Toluene, Ethyl Benzene and all Xylenes)

### **3.4.2 Groundwater Assessment**

According to the IRP RI well construction records, the groundwater level in the Hardwood Range area ranges from 5 to 15ft below the ground surface. This information indicates that groundwater may be encountered during the tank removal activities. Samples will be collected from the excavation, if water is exposed, using weighted bottles or similar devices that minimize aeration of the sample. Observation of any sheen or discoloration present on the water surface will be documented and included in the closure assessment report.

### **3.4.3 UST And Associated Piping Inspection**

After the USTs and associated piping are removed, their condition, including any pitting or corrosion, will be checked and documented in the field logbook.

### **3.4.4 Field Documentation**

All documentation shall be written in black, waterproof ink. Corrections shall be marked through with a single line, then dated and initialed. Logbooks shall be bound notebooks with water-resistant or waterproof pages, sequentially numbered by either mechanical imprint or hand-written entry. Any partially filled page shall have a line drawn diagonally from below the last line entry to the bottom of the page. Individuals making entries shall sign and date the bottom of each page of the logbook. Entries shall be legible, and the logbooks shall be suitable for placement in an evidentiary file. Various aspects of field activities will be recorded in project-specific site and field logbooks.

#### **3.4.4.1 Site logbooks**

The site logbook is a chronology of field activities, but does not contain the same level of detail as the field logbook. The site logbook shall be used to record daily weather conditions, personnel, and activities, and shall reference the appropriate field logbooks and data forms. All field changes in scope with supporting rationale shall be recorded in the site logbook. The ASI site manager shall be responsible for maintaining the site logbook.

#### **3.4.4.2 Field logbooks**

Field logbooks are assigned to specific activities during the field activities, *e.g.*, excavation, tank removal, sampling, *etc.*, and are numbered consecutively. Entries must be made in real time, chronicled in the left margin of each page corresponding to the specific entry. It is recommended that the entries be photocopied regularly and that the photocopies be stored in a secure location as backup documentation in the event that the original logbook is lost. The cover must contain similar information to the site logbook, except that it must be identified as the field logbook for a specific activity.

### **3.4.5 Instrument Calibration**

The photoionization detector used to screen for the presence of organic compounds shall be calibrated daily, according to the manufacturer's instructions, using 100ppm isobutylene gas. The daily calibration shall be documented in the field logbook.

### 3.4.6 Sample Numbering System

The designation for screening and confirmatory samples will employ a six-character code. The first two characters, *HR*, indicate that the sample is from Hardwood Range. The next two characters indicate the UST associated with the sample: *DT* for diesel tank and *GT* for gasoline tank. The next two characters indicate the sample media and location within the UST excavation pit: *SN* for soil sample at north wall, *etc.*, *SB* for soil sample from the base of the pit, *GW* for groundwater from the tank pit, *WW* for waste water, and *SC* for soil screening samples. An additional letter *D* will be added on the end for duplicate samples if applicable. Examples follow: *HR-GT-SE-01*, *HR-OT-GW-01*, *HR-GT-WW-01*, *HR-GT-SE-02-D*, *etc.*

### 3.4.7 Sample Containers and Labels

Sample containers will be purchased in precleaned condition from the laboratory, and the sample labels will be supplied by ASI (Appendix C).

### 3.4.8 Sample Packaging and Shipment

Samples will be placed in a shipping container and surrounded with double-bagged water ice (or blue ice) so that the temperature of the samples is maintained at 4° C. Packing material will be used to secure the samples in the shipping container to prevent movement of sample containers and the breakage of glass containers. The chain-of-custody (COC) form will be placed in a plastic bag and taped inside the lid of the shipping container. The lid of the shipping container will be secured with strapping tape, and custody sealed to ensure that samples have not been disturbed during shipment.

### 3.4.9 Field Changes

Although all field activities will be conducted according to this Work Plan, changes may occur in response to actual site conditions. Any changes made in the field will be approved by HAZWRAP and the NGB Project Managers. All changes will be documented in the field and site logbooks, and on Field Change Forms (Appendix C)

## 3.5 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

### 3.5.1 Equipment Decontamination Procedures

Sampling equipment shall be decontaminated according to the following procedures, as a minimum.

1. Remove visible contamination.
2. Wash/scrub with laboratory-grade phosphate-free detergent (Liquinox® or equivalent).
3. Rinse with potable water.
4. Rinse with deionized water.
5. Rinse with methanol (methyl hydrate or isopropyl alcohol shall not be used).
6. Air dry and wrap equipment in polyethylene sheeting or bags.

Decontamination of reusable protective equipment and clothing (gloves, boots, hardhat, *etc.*) will be accomplished by the following procedure, as minimum:

1. Wash with laboratory-grade phosphate-free detergent (Liquinox® or equivalent).
2. Rinse with potable water.
3. Rinse with methanol (methyl hydrate or isopropyl alcohol shall not be used).
4. Rinse with deionized water.
5. Place in polyethylene bag (as necessary) to prevent contamination during storage.

### 3.5.2 Prevention of Cross Contamination

In order to prevent cross contamination, samplers shall don a fresh pair of rubber gloves between samples, and sampling equipment such as scoops, bottles, and bailers shall be decontaminated before the collection of each sample.

Sample containers and sampling equipment shall not be allowed direct contact with the ground, excavated soils, or water. Plastic bags and ground covers will be used, as needed.

### 3.5.3 Chain of Custody Protocol

Maintaining sample integrity after collection is an integral aspect of the sampling protocol. Sample custody must be traceable to allow tracking of sample possession. Each sample will be designated on a COC form (Appendix C). The appropriate COC form will be prepared by the ASI site manager or his designee. The custody of a sample is maintained if one or more of the following criteria are met.

- The sample is in the possession of the sampler.
- The sample is in view of the sampler after relinquishing possession.
- The sample is in a designated secure area.

The following information must be provided on the completed COC form:

- project name and contract number,
- signature of sampler,
- sampling location,
- unique sample number,
- date and time of collection,
- grab or composite designation,
- matrix,
- preservatives, and
- signature of individual relinquishing custody of the sample.

As the sample is prepared for shipment, a custody seal (Appendix C) must be completed and applied to the respective sample container across the lid or cap. This will prevent unauthorized opening and tampering during shipment. It is not recommended that the custody seal be applied across the top of a volatile organic analysis 40-ml vial with rubber septum, because solvents contained in this adhesive could enter the sample through the septum. For this type of container, the custody seal shall be applied around the side of the cap, overlapping the glass vial, to prevent tampering.

The completed COC form will be placed in a plastic zip-topped bag and taped to the inside of the top of the insulated shipping container. If multiple containers are used, a separate COC form must be completed for each sample container. After each shipment is packed, a completed custody seal will be

affixed on the outside of the insulated container, at each end, spanning the lid and the body of the cooler.

When samples are relinquished to a commercial carrier for transport, the unique identifying number from the airbill/receipt will be recorded on the COC form or in the site logbook. Individuals receiving samples at the laboratory will sign, date, and record time of shipment receipt on the COC form.

#### **3.5.4 QA/QC Samples**

The types of QA/QC samples to be collected during full scale contamination assessment field activities include trip blanks, field duplicates, matrix spike/matrix spike duplicates (MSMSDs), equipment rinsates, and field blanks. These samples are collected to ensure reproducibility and accuracy of laboratory methodology and protocols and to detect cross-contamination during sample handling, shipment, and storage.

##### **3.5.4.1 Trip blanks**

Trip blanks provided by the environmental laboratory are used to detect contamination by volatile organic compounds (VOCs) during sample shipping and handling. Trip blanks are 40-ml volatile organic analysis (VOA) vials that are filled in the laboratory with American Society for Testing Materials (ASTM) Type II/deionized water, transported to the sampling site, and returned to the laboratory with VOA samples. Trip blanks shall not be opened in the field. One trip blank is to accompany each shipping cooler containing VOA samples. Trip blanks shall be stored at the laboratory with representative samples and analyzed along with those samples. Trip blanks are only analyzed for VOCs using the same analytical methods used on soil and groundwater confirmation samples.

##### **3.5.4.2 Field duplicates**

QA/QC duplicate soil samples are generally collected along with laboratory samples, but a single sample may be subdivided for replicate analyses after receipt by the laboratory, if so specified by analytical protocol.

Samples submitted for VOC analysis shall not be combined or split. The duplicate quantity collected shall be from the same sample collection device as the laboratory sample. Field duplicates shall be collected and analyzed at a frequency of 10% of the samples-collected per matrix per event (*i.e.*, 1 to 10 samples collected requires 1 field duplicate; 11 to 20 samples collected requires 2 field duplicates, *etc.*).

##### **3.5.4.3 MS/MSD samples**

To ensure a high degree of accuracy in analyte detection, MS/MSD samples will be periodically analyzed, and the need for separate additional sample matrix material for these analyses will be determined by consultation with the analytical laboratory.



#### **3.5.4.4 Equipment rinsates**

Equipment rinsates are samples of ASTM Type II/deionized water that have passed through decontaminated sampling equipment. They are used to assure decontamination-process effectiveness. Equipment rinsates are collected at a rate of 10% of the decontaminations per matrix per event (i.e., 1 to 10 decontaminations require 1 equipment rinsate; 11 to 20 decontaminations require 2 equipment rinsates, *etc.*). If more than one type of equipment is used to obtain samples for a particular matrix, a rinsate blank must be collected from each piece of equipment. For example, if groundwater samples are collected by a bailer and by a pump, a rinsate blank must be submitted for each. Equipment rinsates shall be analyzed for the same analytes of concern as are the samples that were collected that day.

#### **3.5.4.5 Field blanks**

Field blanks are samples of source water used for decontamination. At a minimum, one sample shall be collected and analyzed for each source of water for a given event. Usually, there will be two field blanks per event—a sample of potable water (used for steam cleaning) and a sample of ASTM Type II/deionized water (used for decontamination). If more than one lot number of ASTM Type II/deionized water is used or if potable water is taken from more than one location, an additional field blank shall be taken, since these constitute different sources.

### **3.6 ADDITIONAL REQUIREMENTS**

#### **3.6.1 Health and Safety**

The site-specific Health and Safety Plan, to which all personnel shall adhere, comprises Appendix B of this Work Plan. Supplemental safety procedures shall be implemented, as necessary, in addition to OSHA requirements. The-ASI on-site health and safety officer shall be responsible for ensuring compliance with all requirements outlined in the Health and Safety Plan.

#### 4.0 PROJECT ORGANIZATION

Investigative activities associated with the Closure Assessment during the USTs removal at Hardwood Range Facility will be conducted by:

Advanced Science, Inc.  
165 Mitchell Road  
Oak Ridge, Tennessee 37830  
Telephone (615) 483-1274  
FAX (615) 483-6355

A list of key personnel and brief descriptions of their responsibilities for the project follow.

1. ANGRC/CEVR Project Manager (Henry Lowman) - ANGRC/CEVR representative with overall responsibility for all efforts associated with this Closure Assessment Work Plan under the RRI taking place at the Base.
2. HAZWRAP Project Manager (Don Miller) - HAZWRAP representative responsible to ANGRC/CEVR for all RRIs under this SA Plan at Hardwood Range. He will coordinate between ANGRC/CEVR and ASI personnel.
3. ASI HAZWRAP Program Director (Don Hudson) - Contract Administration.
4. ASI Project Manager (Joe Hawk) - Oversight of project administration, investigative activities, and document review.
5. ASI QA/QC Coordinator (Paul Ortstadt) - Ensure compliance with QA/QC project protocol.
7. ASI Site Manager (B. Foard) - Oversight of field activities, coordination of soil boring and monitoring well installations and sampling, technicians, subcontractors, site-specific Health and Safety plan, and implementation of client-designated change requests.

## 5.0 REFERENCES

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- HAZW, (Hazardous Waste Remedial Action Program), 1990. "Standard Operating Procedures for Site Characterizations", Document No. DOE/HWP-100.
- RSI, 1991. Letter from Merlin S. Hoiseth of RSI to Edwin C. Walter, Volk Field Civil Engineering, documenting UST leak testing results, October.
- WDNR (Wisconsin Department of Natural Resources), 1991a. "Soil Sampling Requirements for LUST Site Investigations and Excavations", PUBL-SW-127, March.
- WDNR, 1991b. "Site Assessment Guidance - Wisconsin Department of Natural Resources (WDNR) - North Central District", July.
- WDNR, 1991c. "Leaking Underground Storage Tank (LUST) Analytical Guidance", June.
- DILHR (State of Wisconsin, Department of Industry, Labor and Human Relations), 1990. "Flammable and Combustible Liquids Code and Associated Fees", ILHR Chapter 10.

**Appendix A**

**APPLICABLE STATE REGULATIONS**

(Excerpt from the State of Wisconsin's Department of Industry,  
Labor and Human Relations Flammable and Combustible Liquids Code,  
Chapter ILHR 10.)

## APPENDIX B

### SITE ASSESSMENTS FOR UNDERGROUND STORAGE TANKS

#### I. Introduction

##### A. Purpose of the Site Assessment:

The purpose of the site assessment is to check during underground storage tank (UST) and piping closure or change in-service for the presence of spilled or leaked petroleum products where they are most likely to be found. If contamination is discovered, additional sampling or cleanup may be required by the Department of Natural Resources (DNR).

##### B. Owner/Operator Responsibilities During UST Site Assessment.

The UST system owner/operator's responsibilities during a tank closure are summarized below.

1. Notify the local fire chief, fire inspector or other DILHR authorized agent at least 30 days prior to closing the UST. Shorter notification periods may be locally acceptable (Section III (A));
2. Close the tank system in accordance with s. ILHR 10.732;
3. Complete a "Tank Inventory Form", (SBD-7437);
4. Complete the sampling, analysis, and documentation requirements for site assessments (Section IV - VIII):
5. Report any spills or leaks from the tank or piping to the DNR immediately (Section VIII); and
6. Send a copy of the site assessment report to DILHR and a copy to the DNR (Section IX). Include a copy of the (SBD-7437) inventory form which was submitted at closure.

#### II. Applicability

Site assessments must be performed whenever they are required under the provisions of ch. ILHR 10.

### III. Pre-Assessment Steps

#### A. Notify the Local Authority Which has Jurisdiction:

You must notify your local DILHR - authorized agent at least 30 days in advance of beginning the UST system site assessment. (A shorter notification period may be allowed by the local authorized agent.) The notification shall be in writing.

Note: You should also always check for local ordinances which may govern tank closures. DILHR's rules are minimum standards and local ordinances may be more restrictive. At the time of notification, you should check with the local authorized agent to ascertain if he or she is willing to serve as the "neutral third party" during the assessment.

#### B. Arrange for a Neutral Third Party:

Each site assessment must be observed by a "neutral third party". Any of the following individuals may serve as a neutral third party:

- A DILHR employee;

- A DILHR deputy (fire chief or fire inspector);

- Other local officials; or

- A private inspection contractor.

#### C. Develop a Site Assessment Plan

The site assessment must be guided by a plan which addresses each applicable item listed in Sections IV to VI. The plans shall be available at the site during the site assessment for inspection by the fire chief or local authority having jurisdiction.

Note: The responsibility for developing and following the plans listed in 1 - 3 below belongs to the owner or to the contractor(s), consultant(s), or individual(s) acting as the owner's agent.

##### 1. Field Procedures Plan:

The site assessment must be guided by a plan which addresses each item from Section IV through VI below.

##### 2. Tank Cleaning and Tank Waste Management Plan:

This plan must include the following elements:

- a. Methods to be used to vent and clean the tank.

- b. A plan for managing gasoline, sludge, accumulated water or other tank contents. This plan must be in compliance with DNR solid and hazardous waste rules. Guidelines for managing tank wastes are available from DILHR or DNR.

Note: Specifications for tank removal may be found in API Standard 1604 or other equivalent standards may be used.

- c. A plan for transporting tanks which are to be removed from the ground and description of the final disposal point of the tank.

Note: Tank transportation shall be in compliance with federal DOT rules.

Note: The plan should include methods for protection the safety and health of employees as addressed in Section 1910--OSHA regulations.

- 3. A Contingency Plan for Managing Contaminated Soils and Contaminated Excavation Water:

The contaminated soils and excavation water management plan must meet minimum requirements established by the DNR.

#### IV. Sample Collection Requirements

##### A. Who Can Collect Soil Samples:

Samples must be collected by persons familiar with proper soil and groundwater sampling and handling procedures. These individuals must be person certified by DILHR in collection of environmental samples at UST site assessments. Individuals who do not meet one of these qualifications may collect soil samples if they are working under the direct supervision of an individual present during the sampling who is certified.

- 1. The person is a hydrogeologist meeting the minimum qualifications of NR 500.02 (64), Wis. Adm. Code.
- 2. The person is a registered professional engineer who has certification or licensing that includes education and experience in environmental engineering.
- 3. The person is certified by DILHR in collection of environmental samples at UST site assessments.

##### B. Soil Sample Locations:

- 1. At Sites Where No Soil is Overexcavated:

Samples must be collected in the native soil material, or if the site is fill material, samples may be collected from the original fill (as opposed to the tank cavity fill material). Samples must be collected from all of the following locations:

- a. At points where strong odors or soil discolorations indicate the presence of contamination;
- b. In native soil one to three feet beneath the bottom of each end of each tank in the excavation;
- c. In native soil one to three feet beneath the surface underneath each island on the supply side;
- d. In native soil one to three feet beneath the surface every 20 feet, or segment thereof, along piping runs. In meeting this requirement, samples should preferentially be taken under swing joints, flex connectors, or pipe elbows;

Note: At a minimum, two samples along the piping are required--one at the island and one along the piping run.

- e. When tanks are to be abandoned in place, soil sampling must be performed. This may be accomplished in two ways:
  - i. If the tank(s) can be safely entered, and holes can be cut in the bottom, the soil beneath the tank(s) may be sampled through the holes. The holes must be located near each end of each tank.
  - ii. If the tank cannot be entered, then soil borings must be installed using a drill rig. The borings must be located as close as possible (less than three feet) from each end of each tank. Soil borings along piping runs and pump islands must be located immediately adjacent to these structures. The borings must be completed and documented in compliance with the requirements of NR 141.
- f. If the water table is found within the tank or piping excavation, soil samples should be collected at the sidewalls of the excavation at the locations described in V(B)(1-5) above. As an alternative, an approved sump may be installed within the excavation and a sample of accumulated water taken within two weeks of the sump's installation.

2. At Sites Where Soils are Overexcavated:

At sites where contaminated soils are overexcavated, and the quantity of contaminated native soils is less than 10 cubic yards, the soil sampling requirements of IV (B)(1)(b - f) must be met except that samples must be taken at the limits of the excavation in those areas where soils are excavated.



Note: At sites where the quantity of excavated contaminated soils is greater than 10 cubic yards, the sampling and analysis requirements must be performed in accordance with approved DNR procedures. Contaminated soils must be managed in accordance with approved DNR procedures.

C. Variances to sampling requirements:

1. Redundant samples need not be taken. For example, if the dispenser is directly above the tank, a single sample will meet requirements IV(B)(1) b. and c.
2. If free product, soils with petroleum products or other conditions make it obvious that a site investigation and corrective actions will be needed at a site, a closure assessment with soil sampling need not be completed provided that the DNR is immediately notified and appraised of site conditions and a work plan for addressing the contamination is submitted to the DNR.

E. Field Instruments:

Field instruments including photoionization detectors flame ionization detectors and portable gas chromatographs may be used for field screening of soil samples and to choose samples to be tested at a laboratory, thus potentially reducing the number of samples which must be laboratory analyzed. Field instruments shall be used in accordance with DNR approved field instrument techniques (See Supplement A to this Appendix).

If field instruments are used to screen soil samples, the samples with the three highest readings on the field instrument must be sent to a laboratory for analysis in conformance with VI below. (If only two samples are required because the dispenser is directly over the tank end, both samples must be sent to a laboratory for analysis.)

If there are two or more tanks in an excavation, the five samples with the highest readings must be sent to a laboratory for analysis in conformance with VI below.

V. Sample Collection Techniques

Soil and excavation water samples must be collected using techniques for sample collection approved by the DNR. The most current version of these methods are included as Supplement B to this Appendix.

VI. Sample Parameters and Methods

A. Parameters:

All soil samples must be analyzed by product. The results must be reported in parts per million on a dry weight basis.

All excavation water samples must be analyzed volatile organic compounds.

B. Methods:

Soil and excavation water analysis must be conducted by a laboratory certified under NR 149 for purgeable organics. All analytical methods must be approved by the DNR.

VII. Documentation Requirements for UST's

Site assessments must be properly documented to show that the requirements of s. ILHR 10. are met or exceeded. The following are minimum documentation requirements:

A. Site Background Information:

A narrative describing the following site background information must be included:

1. Site Owner and UST System Owner/Operator;
2. Engineering Consultant;
3. Excavation Contractor;
4. Description of the Property Use;
5. Number of Tanks on Site Currently and Any Previously Removed;
6. Results of Previous Geotechnical Investigations;
7. Previous Leaks or System Repairs;
8. Analysis of Inventory Records, If Available; and
9. Site Address.

B. Site Location Map:

A map describing the location of the site relative to nearby towns, streets or major highways. Blow-ups of USGS topographic maps, highway maps, or plat maps with the site location clearly marked are acceptable as a site location map.

C. Site Layout:

The site layout should be a plan view of the site with locations of tanks, piping, dispensers, utilities, buildings, numbered field screening sampling points, numbered laboratory sampling points, results of field screenings and laboratory sample analysis and other relevant data clearly marked. Minimum scale shall be 1" = 20'.

D. Tabulated Field and Laboratory Data:

All field and laboratory results shall be presented in tabular form.

E. Narrative/Observations:

A narrative should be provided noting presence of free product, soil staining, odors, soil types, tank and piping conditions, possible leak locations, and other pertinent observations.

F. Procedures:

Procedures for the following activities shall be reported:

1. Soil sampling techniques including sample collection methods, and sampling tool cleaning methods;
2. Field instrument methods; and
3. Excavation water sampling methods.

G. Photographs:

Any photographs submitted must be either color photocopies, originals, or reprints of originals. Black and white photocopies of photographs are not acceptable for documenting site conditions.

H. Documentation of Tank, Waste Product, and Sludge Disposal:

The closure assessment report shall document the final disposal or reuse of the tank and piping system. The report shall also document the methods used to remove all liquids and sludges from the tank and the methods used to store, transport, and treat or dispose of these products.

I. Other:

Any other information requested by DILHR must also be included.

VIII. Release Reporting

If a release is detected during the tank closure change-in-service, site assessment, the owner/operator must contact the DNR immediately to report the release. The necessary actions after reporting will vary depending on several factors including the degree of contamination, the depth to ground water, and the nature of surrounding land use.

IX. Reporting of Tank Closures

The closure of an UST site must be reported to the Safety and Buildings Division through the use of a "Tank Inventory Form" (SBD-7437). This form is to be completed and submitted to the address shown on the form, by the owner/operator immediately after closure. The submitted form will be used to update the Division's UST inventory.

Copies of the full site assessment report must be submitted to both DILHR and DNR. DILHR's copy can be sent to:

Bureau of Petroleum Inspection and Fire Protection  
P.O. Box 7969  
Madison, WI 53707

DNR's copy must be sent to the DNR District Underground Storage Tank Coordinator.

The DNR will review the closure assessments on a site-by-site basis. Based upon the contamination identified and site characteristics, a decision will be made by the DNR on the need for further investigation or corrective action.

APPENDIX B

SUPPLEMENT A  
SOIL SAMPLING REQUIREMENTS

A. General Requirements:

1. Soil samples must not be composited for analysis.
2. Soil sampling tools must be cleaned between sampling locations.
3. To reduce the loss of volatile hydrocarbons, samples must be collected in a manner which causes the least disturbance to the soil and samples must be placed in appropriate sample containers and packaging immediately after being collected.
4. If hand held tools are used to collect samples, the first three to four inches of soil must be scraped away just prior to sampling so that the sample is collected from a previously unexposed soil area.
5. All samples must be labeled with the sample number, location, date, sampler, and parameters to be analyzed.

B. Soil Sampling Methods:

1. If the UST system is closed by removal of the tank system from the ground, the following sample collection method must be used:

If the excavation, pipe trench or other sampling location can be entered in accordance with applicable OSHA regulations, samples may be collected using a hand auger or other undisturbed sampling method. If the excavation, pipe trench or other sampling location cannot be entered safely for sampling, a sample must be collected from the excavation using a hand auger extension or from the backhoe bucket. If samples are collected from the backhoe bucket, a hand held auger which collects the sample as a "core" must be used.

2. If the UST system is closed by abandonment in place, soil samples shall be collected through one of the following techniques:

If the tank is entered for cleaning and samples are collected through holes cut in the tank, they shall be collected using a hand held soil auger or other undisturbed sampling method. If drilling is used to collect the samples, then split spoon (barrel, tube) samplers or thin walled (Shelby) samplers must be used.

C. Excavation Water Sampling Methods:

Samples of water must be collected from excavations as soon as the water is exposed. Collection must be made with the use of weighted bottles, or other similar devices which minimize the aeration of the sample. Documentation of any sheen or discoloration present on the water surface must be included in the closure assessment report.

D. Sample Containers:

Samples shall be collected in containers obtained from the laboratory which will analyze the samples. If the laboratory offers pre-weighed bottles, these shall be used. Immediately following samples collection the samples must be cooled to 40°F by refrigeration or by placing the samples in a container and surrounding them with ice. Samples must remain in this condition while being transported to the laboratory. Maximum sample holding times must not be exceeded.

APPENDIX B  
SUPPLEMENT B  
FIELD INSTRUMENT TECHNIQUES

Photoionization detectors, flame ionization detectors and portable gas chromatographs may be used to screen soil samples using the "head-space" method for the purpose of reducing the number of samples which must be laboratory analyzed. The following procedures must be followed if field instruments are used for this purpose. The use of field instruments for other purposes is not covered by this procedure.

General Requirements:

- A. All field instruments must be maintained, and calibrated following a schedule recommended by the manufacturer.
- B. All field instruments must be "zeroed" in the field at the location the head space analysis is performed.
- C. If a sample location is to be screened using a field instrument, and submitted for laboratory analysis two samples must be collected from the sampling location. The first sample must be collected, labeled and cooled in accordance with laboratory and regulatory requirements for soil sampling. The second sample must be immediately placed in a clean jar obtained from an environmental laboratory. If jars are not obtained from an environmental laboratory or if you are not sure if they are free of organic vapors the atmosphere inside the jar should be sampled with the field instrument prior to filling the jar with the sample.
- D. The sample jar must be covered immediately with a tight fitting cap or collar equipped with a tight fitting, capped septum. The sample must then be broken into the smallest pieces possible by shaking or agitation.
- E. Allow the sample jar to stand for 5 or 10 minutes in a location over 70°F which is out of direct sunlight.
- F. Remove the septum cap and insert the field instrument tip to the head-space above the soil sample taking care not to contact the soil with the instrument's tip.
- G. Record the highest reading achieved on the instrument.

SECTION 2. Ch. Ind 8 is repealed.

SECTION 3. Ind 69.10 (1) is repealed and recreated to read:

Ind 69.10 (1) Fees for the registration and use permit renewal for underground storage tanks, the examination of plans and site inspections for tanks used for the storage of flammable and combustible liquids, liquefied petroleum gas, liquefied natural gas and compressed natural gas shall be determined in accordance with 10.

SECTION 4. Ind 69.10 (1) Table 69.10 is repealed and recreated to read:



Table 69.10

Type of Registration, Renewal, Examination or Inspection	Fee
<u>FLAMMABLE LIQUID TANKS OR COMBUSTIBLE LIQUID TANKS OR BOTH</u>	
Use Permits	
Initial Issuance and Renewal of Use Permit for Underground Storage Tank (Tanks within the scope of Subch. VI of ch. ILHR 10 only) . . . . .	\$100.00*
Plan Examination	
All Tanks Under 5000 Gallon Capacity . . . . .	(No state plan examination fee required; local fire department approval may be required - minimum local plan examination fee - \$35.00. The local governing body for the govern- mental unit responsible for the plan examination may establish a plan examination fee which is more than \$35.00.)
All Tanks within Scope of Subch. VI of ch. ILHR 10 and Aboveground Tanks within the Scope of Subch. VI and Having a 5000 Gallon Capacity or Larger	
Facilities With 10 or Fewer Tanks . . . . .	\$35.00 for the first tank plus \$10.00 for each additional tank.
Facilities With 11 or More Tanks. . . . .	\$150.00
Site Inspection Fees	
Facilities With Only One Tank. . . . .	\$100.00
Facilities With Two or More Tanks. . . . .	\$ 50.00 for each tank up to \$1700.00.
Addition of Spill and Overfill Protection Only . .	\$22.00
Conversion of Full-service Stations to Self-service or Conversion to Key-Card-Code	
Plan Examination . . . . .	\$35.00
Site Inspection. . . . .	\$43.00
<u>LIQUEFIED PETROLEUM GAS, NATURAL GAS OR COMPRESSED NATURAL GAS</u>	
125 to 1,999 gallon water capacity tank . . . . .	(No state examination or inspection fee required; local fire department shall be provided with a Compliance Certification Form at time of installation)
2000 Gallon Water Capacity and Above	
Plan Examination Fee . . . . .	\$43.00 per tank
Site Inspection Fee . . . . .	\$43.00 per tank

## PLAN REVISIONS

Plan Revision Examination Fee . . . . . \$22.00 per revised plan  
\*The \$100.00 registration and use permit renewal fee is divided with \$80.00 being sent to the fire department which inspected the tank to help defray inspection and enforcement costs and \$20.00 being retained by the department to offset administration and processing costs. The 80% of the inspection fee shall be paid to the local fire department after the required inspection is completed and the Fire Department Inspection Checklist Form for Underground Tank Installation (SBD-6294) is completed and signed and a copy of the completed and signed SBD-6294 is submitted to and received by the department.

SECTION 5. Ind 69.125 is created to read:

Ind 69.125 CERTIFICATION OF UST SYSTEM SPECIALTIES. All applicants for certification as a UST system installer, tightness tester, or remover, cleaner, reliner, inspector or site assessment provider shall submit, with the application form, fees as specified in this section.

(1) APPLICATION AND INITIAL CERTIFICATION. Persons applying for certification in one or more of the categories specified in sub. (2), shall submit a fee of \$100.00.

(2) CATEGORIES OF CERTIFICATION. Persons may be certified in one or more of the following categories:

- (a) UST system installer.
- (b) UST system remover.
- (c) UST system tightness tester.
- (d) UST system cleaner.
- (e) UST reliner.
- (f) UST system inspector.
- (g) Site assessment provider.

(3) EXAMINATION. Upon determination of eligibility for examination for certification, fees shall be submitted for examination and reexamination as follows:

- (a) Initial examination . . . . . \$10.00 per category
- (b) Examination retakes . . . . . \$10.00 per examination  
per category

(4) EXAMINATION AND TRAINING SEMINARS. Fees shall be assessed on an individual basis from education and training programs the department sponsors or participates in.

(5) RECERTIFICATION. The recertification fee for one or more categories of certification shall be \$100.00 per person.

.....

EFFECTIVE DATE

Pursuant to s. 227.026 (1) (Intro.), Stats., these rules, shall take effect on the first day of the month following publication in the Wisconsin Administrative Register.

.....

**Appendix B**  
**HEALTH AND SAFETY PLAN**

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

Dates of Work: through 1992.

On-Site Task(s):

- ☒ Remove underground storage tanks (subcontract)
- ☒ Excavation of USTs & Associated Piping
- ☐ Installation of monitoring wells (subcontract)
- ☐ Overview product recovery

#### SITE HAZARDS

- |  |   |
|--|---|
| <input type="checkbox"/> Confined Space Entry                  | <input type="checkbox"/> Excavation Heavy Equipment |
| <input checked="" type="checkbox"/> Trenching/Excavation       | <input checked="" type="checkbox"/> Fire/Explosion  |
| <input checked="" type="checkbox"/> Inhalation of Toxic Vapors | <input type="checkbox"/> Inhalation of Toxic Dusts  |
| <input checked="" type="checkbox"/> Direct Contact Hazard      | <input type="checkbox"/> Traffic Hazard             |

#### LEVEL OF PROTECTION

Level-D

Level-C (if action levels of Section 2 are exceeded)

#### SITE PERSONNEL

<u>Site Manager(task supervisor)</u>	<u>B. Foard</u>
<u>Site safety officer</u>	<u>B. Foard</u>
<u>Instrument Operator(air mon.)</u>	<u></u>
<u>Site Geologist</u>	<u>NA</u>
<u>First Aid/CPR</u>	<u>B. Foard</u>
<u>Samplers</u>	<u>B. Foard</u>

#### SUBCONTRACTORS: (USTs Removal)

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_  
Authorized Representative: \_\_\_\_\_

H&S Approval:	_____	Date:	_____
PE Approval:	<u>N/A</u>	Date:	_____
PJT MGT Approval:	_____	Date:	_____

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

## 1.0 SITE DESCRIPTION/HISTORY:

### Site Type:

<input type="checkbox"/> Active	<input type="checkbox"/> Service Station	<input type="checkbox"/> Unknown
<input checked="" type="checkbox"/> Inactive	<input type="checkbox"/> Refinery	<input checked="" type="checkbox"/> Other: Military Installation
<input checked="" type="checkbox"/> Secure	<input type="checkbox"/> Tank Farm	<input type="checkbox"/> POL Tank Farm
<input type="checkbox"/> Unsecure	<input type="checkbox"/> Industrial	
<input type="checkbox"/> Enclosed Space	<input type="checkbox"/> Well Field	

lim: accessible to base personnel, but not to the general public.

Surrounding Population: ☐ Residential ☐ Industrial  
☐ Rural ☐ Urban  
☒ Other: Military Base

Sites Description/Features: See Section 1.0 (Introduction) of the Closure Assessment Work Plan for site description and maps.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

## 2.0 SITE HAZARDS

### I. Physical Hazards:

#### Fire/Explosion

Free product vapors in the excavations may form flammable/explosive mixtures. They may also displace oxygen.

#### Excavations

Excavations are necessary to expose USTs and piping for removal. Oxygen deficiency may be present due to air displacement by product vapors. Dangerous areas must be properly labelled and controlled to prevent unauthorized personnel from entering. Monitoring with LEL/O<sub>2</sub> meter is required prior to entry. Excavations over five (5) feet deep must be shored or sloped to comply with OSHA requirements. See trenches below.

#### Cold Stress

Cold Stress monitoring will be performed when temperatures are below 60 °F. Personnel will not work if oral temperature are below 96.8 °F. See cold stress attachment.

### II. Chemical Hazards:

Unleaded Motor Fuels  
such as:  
Gasoline  
Diesel fuel

Occupational Exposure Standard (inhalation) PEL 300 ppm. Respiratory protection action limit 150 ppm. Meter Gasoline response which corresponds to the action limit is Diesel Fuel instrument-dependent. Vapors are heavier than air and collect in low areas.

Personnel are not authorized to enter into trenches or other excavations under this task.

#### *Health Effects*

Components of petroleum hydrocarbon fuels are suspected or confirmed carcinogens. Care should be taken to minimize exposures even when they are below the occupational exposure limits.

Inhalation of vapors may cause dizziness, nausea, headache, and irritation of mucus membranes.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

Repeated skin contact with liquid may cause dermatitis. Reddening and cracking of the area is common.

***Fire and Explosion Hazard***

Petroleum hydrocarbon vapors are flammable and tend to collect in low-lying areas. Care must be taken to exclude ignition sources when vapor concentrations exceed 25% of the LEL.

**Unleaded Gasoline**

***Breathing Zone Concentrations***

PEL 300 ppm  
REL No REL  
TLV 300 ppm

HNU/OVM PEL equivalence is 75 ppm because meter detection efficiency is 25 percent for gasoline. The protection factor for calibration limitations, moisture, etc., brings the action level to 50 ppm.

**Diesel Fuel**

***Breathing Zone Concentrations***

PEL 400 ppm Petroleum Distillates  
REL 350 ppm Petroleum Distillates  
TLV 300 ppm VM&P naptha

HNU/OVM PEL equivalence is 75 ppm because meter detection efficiency is 25% based on gasoline. The protection factor for calibration limitations, moisture, etc., brings the action level to 37 ppm.



Site Name: Hardwood Range  
 Location: Volk Field, Wisconsin  
 Project #: 9661-04-92

### 3.0 MONITORING EQUIPMENT

Safety Equipment	Monitoring Frequency	Action Limit*1	Action/Logic
PID 10.2 eV probe	(H)	0 - 50 ppm	Diesel, gasoline, or waste oil. Level-D permitted
		50 - 150 ppm	Use APR or withdraw.
Monitor-4	N/A	>Bkg	No radioactive wastes reported.
LEL/O <sub>2</sub>	(H)	0-10 % LEL	Continue working. Identify sources of vapors.
		abv 10% LEL	Ventillate to reduce vapor concentration in trench. (Intrinsically safe exhaust fan) Have pumper on standby. INERT TANK if necessary. Verify effectiveness. (Be sure that readings are taken at top and bottom of excavations. Vapors will tend to collect at bottom.
Oxygen content		19.5 - 25%	No special requirements.
		less than 19.5%	Ventilate. Personnel are not authorized to enter oxygen deficient atmospheres without specific written authorization.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

Thermometer (*1)	97.6-99 °F	Normal range of body (oral) temperatures. Keep working. Monitor & record temperature every 4-hours.
	below 97.6	Monitor each hour and look for visible signs of frostbite/frostnip.
	96.8	Take worker to a heated area such as a heated vehicle or building. Worker is not permitted to resume field work until body temperature returns to normal.

See Cold Stress attachment 1 for treatment.

(C) means continuous monitoring

(H) means monitoring periodically (minimum rate: once per hour)

N/A means not applicable.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

#### 4.0 EXPOSURE SYMPTOMS

No chemical exposure symptoms are generally anticipated at environmental concentrations. The information provided is generally associated with concentrations which exceed PEL concentrations.

##### CHEMICAL EXPOSURE

Gasoline/Diesel	Headache	Withdraw to upwind area
	Nausea	Check for heat stress
	Irritated eyes	Change chemical cartridges
	Irritated nose	
	Odors	

##### FIRST AID

Move victim to fresh air.

\*\*\*

If unconscious, give artificial respiration or CPR as necessary. Seek medical attention.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

## 5.0 PERSONAL PROTECTIVE EQUIPMENT

Air Purifying	SOP (Level C)	Use if action level is exceeded. Full face APR manufactured by Respirator (APR) American Optical or Mine Safety and Appliance Company.
APR cartridges	SOP (Level C)	Use if action level is exceeded. Combination cartridges approved for organic vapors(OG), Particulate (HEPA filter), and pesticides. A.O.: R53HE MSA: GMA-H
Disposable Coveralls	SOP	Keeps clothes clean. Provides an additional layer of insulation against cold.
Rubber Safety Boots	Recommended	Can be decontaminated. Potential for contamination with oil/grease.
Leather Safety Boots	SOP	Leather safety boots provide the protection necessary for physical hazards. Leather boots should be covered with disposable booties if hazardous chemicals may be present.
Latex Booties	Optional	Simplifies decontamination. May be used over chemical safety boots.
Gloves, (Outer)	SOP	Skin absorption hazard potential is minimal. Work gloves made of cloth/leather are acceptable.
Gloves (inner) Surgical	Recommended	Standard operating procedure.
Safety Glasses or Goggles	SOP	Eye hazards such as branches, dust, etcetera.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

Hard Hat                      SOP

Heavy equipment operations involving  
pipes/auger flights. Potential for head  
injuries.

Hearing protection              SOP

If noise is over 85 decibels.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

## 6.0 EQUIPMENT CHECK LIST

### RESPIRATORY PROTECTION

- ☐ SCBA
- ☐ Spare Tanks
- ☐ Air Line Respirator
- ☒ Air Purifying Respirator
- ☒ Cartridges (Specify)  
Organic Vapor
- ☐ ESCBA

### BODY PROTECTION

- ☒ Hard Hat
- ☒ Face Shield/Safety Glasses
- ☒ Gloves
  - ☒ Surgical
  - ☐ Butyl
  - ☐ Neoprene
  - ☒ Nitrile
  - ☐ Viton
  - ☒ Other: Leather Work Gloves

- ☒ Coveralls
  - ☐ Saranex
  - ☒ Tyvek
  - ☐ Cloth
- ☒ Foot Protection
- Chemical Resistant Safety Boots
  - ☒ Leather Safety Boots
  - ☒ Latex Booties
- ☒ Hearing Protection (if noise over 85 db)

### Medical

- ☒ Thermometers
- ☐ Bathroom Scale
- ☐ Blood Pressure Kit
- ☒ First Aid Kit ( a first aid kit is required near each  
operation employing heavy equipment)

### Sampling Equipment

- ☒ SS Spoons
- ☒ Shovel
- ☒ Jars
- ☐ Sample Pans
- ☒ Sample Labels
- ☒ Ice Chests
- ☒ Chain of Custody ☒
- Plastic Bags
  - ☐ Drum Liners
  - ☒ Bailers
  - ☒ Rope
  - ☐ Security Tape
  - ☒ Duct Tape

### DECONTAMINATION

- ☒ Tubs
- ☒ Brushes
- ☒ Cleaner
- /Sanitizer  
(respirators)
- ☒ Alconox
- ☒ Water
- ☒ Solvent: Methanol  
Hexane
- ☐ High  
Pressure Sprayer
- ☐ Steam Cleaner

### SITE CONTROL

- ☒ Traffic Cones
- ☐ Banner Tape
- ☐ Saw Horses

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

Miscellaneous

☐ Beverages, cool  
☒ Notebooks, Field  
☒ Pens  
☒ Eye Wash

MONITORING EQUIPMENT

☒ HNU (10.2 probe)  
☐ HNU (11.7 probe)  
☐ OVM (10.0 probe)  
☒ LEL/O<sub>2</sub> meter  
☒ 100 ppm  
Isobutylene  
☒ (40-50% LEL)  
Hexane

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

## 7.0 SITE ENTRY

### 8.1 Zones of Contamination

Entry into the exclusion zone will be limited to personnel who must be there to perform their duties. Excavation equipment, piping and moving parts of other equipment etc have significant potential to injure nearby personnel. **THE EXCLUSION WILL BE MARKED AS FOLLOWS:** Only authorized personnel are permitted beyond the traffic cones.

#### Contamination Avoidance:

Site inspectors will avoid direct contact with areas suspected to be contaminated. Such areas include:

- . stained soil
- . oily patches
- . walking immediately downwind of potentially leaking drums.

#### Contamination avoidance also includes :

- . Coverings on monitoring equipment
- . Not setting equipment down on contaminated containers
- . etc.

### 8.2 Training Requirements

OSHA regulations require that hazardous waste site personnel to have completed the following training before working on a hazardous waste site:

- |             |  |
|-------------|--|
| 40 hour     | Hazardous Waste Operations and Emergency Response training (HAZWOPER)                                  |
| 8 hour      | Annual HAZWOPER refresher training   |
| 8 hour      | Supervisory training (Supervisory Personnel)<br>(Task Supervisor, Safety Officer, Instrument Operator) |
| Unspecified | Site Specific training (tailgate meeting to discuss site hazards)                                      |



Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

An additional 24 hours of supervised "on the job" training is also required before new workers are allowed to work independently.

Equipment operator must be familiar with calibration, and operation of the monitoring instruments being used.

### 8.3 Medical Monitoring Requirements

All hazardous waste site workers must comply with OSHA requirements for medical monitoring. The medical monitoring requirements are:

- \* Baseline Medical Examination
- \* Annual Medical Examination
- \* Exit Medical Examination
- \* Medical Examinations as appropriate if exposure(s) occur

### 8.4 First Aid/CPR Training

In addition to the above training requirements, OSHA requires that medical help be available or that at least one team member be trained in First Aid/CPR. If the site is more than 30 minutes from the nearest hospital/clinic, one of the team members is required to be currently certified in First Aid and CPR.

### 8.5 Buddy System

All hazardous waste site work will be performed using the buddy system. No field work at waste sites is permitted unless at least two persons are present.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

## 8.0 SITE EGRESS

Egress from the site will not be obstructed.

Personnel who have worked in the contaminated area, must decontaminate before exiting the site.

### 9.1 PERSONNEL DECONTAMINATION

Personnel will wash all exposed skin areas with soap and water, and rinse with potable water. Decontamination is required whenever the person exits the exclusion zone.

### 9.2 MONITORING EQUIPMENT DECONTAMINATION

Remove and properly dispose of protective plastic from exterior of instruments. Wipe exposed surface with dampened cloth to remove residual contamination.

### 9.3 HEAVY EQUIPMENT DECONTAMINATION

Mechanically remove as much contaminated soil as possible in the contaminated area. Move equipment to decontamination area. Clean with high pressure/steam cleaning equipment. Care must be taken to avoid excessive spattering.

### 9.4 WASTE DISPOSAL:

Site work will generate wastes including:

- Excavated Soils
- Decontamination Water/Solvents
- Used expendable PPE/tools

Some wastes generated during this operation may be "hazardous" under federal, state or local laws/regulations. Wastes which are hazardous (or may be hazardous) should be drummed for disposal. Wastes suspected of being hazardous should be tested to determine the required disposal procedure(s).

The wastes should be given to the original generator for disposal, if possible. If the original generator will not accept them, the wastes must be hauled to a licensed hazardous waste facility by a licensed T/S/D transporter.

Non-hazardous wastes may be disposed of as ordinary trash. Do not dispose of anything in a public area unless you have documentation that it is non-hazardous.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

This section must be completed prior to going on-site.

- ☒ Completed at time of approval.  
☐ Must be completed prior to site inspection. A copy will be sent to Bill Kwoka upon return from field work.

#### 10.0 EMERGENCY RESOURCES

Ambulance: 911  
Hospital: \_\_\_\_\_  
Base Infirmary: \_\_\_\_\_  
Fire Department: 911  
Base Fire Dept.: \_\_\_\_\_  
Nearest Telephone: \_\_\_\_\_

	Work Hours	Home
William Kwoka	(615) 483-1274	(615) 482-2558
Alvin Luttrell	(615) 483-1274	(615) 966-4490

All injuries, accidents or releases will be reported to ASI's health and safety department as soon as possible. Many chemical exposures must be assessed by a physician at the end of the work shift.

If ambulance service is more than 30 minutes from the site, the ASI team members should be currently certified in First Aid and CPR.

First aid measures will be taken to stabilize serious injuries if necessary. medical attention will be sought and then the injury will be reported. Serious accidents or injuries must be reported within 24-hours.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

## ROUTE TO HOSPITAL

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

This section must be completed prior to going on-site.

☐ Completed at time of approval.  
☒ Must be completed prior to site inspection. A copy will be sent to Director of Health and Safety (or designee) upon return from field work.

This information is legally required before site entry.

#### 11.0 UNDERSTANDING AND COMPLIANCE STATEMENT

The undersigned persons, listed below, understand the contents of the entire site specific safety plan including this addendum. They also agree to comply with its provisions.

Name (lettered)	Signature	Affiliation
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

The following persons are not required to comply with the provisions of this safety plan, but have been informed of its contents:

Name (lettered)	Signature	Affiliation
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Note: All monitoring results are to be documented in the field log book or separate health and safety log. The original of the results is to be placed task file and maintained per OSHA standard 29 CFR 1910.20.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

**Attachment 1**

**Cold Stress**

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

## COLD STRESS

Cold stress is manifested in many different ways , but generally follows the following progression:

1. Frostnip
2. Frostbite
3. Hypothermia

### FROSTNIP

Frostnip is the most likely form of cold stress to occur. This is because warm buildings and warm vehicles are readily available (within a few minutes walk of the environmental work being performed). These site resources are used to prevent more serious forms of cold stress from occurring.

Frostnip is a mild form of frostbite. Frostnip mainly involves the extremities and exposed skin. Affected areas usually include ears, fingers, toes, and facial skin. Frostnip is not a serious condition, but may progress into more severe frostbite if not treated. Frostnip is the local freezing of surface layers of skin and is characterized by initial reddening and then whitening of the affected area. Frostnip is aggravated by handling of metal objects or working in cold solutions such as those used for decontamination of field equipment.

The signs of frostnip are often ignored by the affected person. The victim feels numbness in the affected area and may even be unaware of the condition. Team members must remember to observe each other to detect early signs of frostnip.

#### Prevention of frostnip:

- \* Cover all skin areas. Be sure to wear gloves and a warm hat.
- \* Avoid direct skin contact with cold air or cold fluids.
- \* If protective equipment gets wet, change into dry protective equipment.
- \* Visually observe your partner for signs of frostnip. Treat if signs appear.

Treatment of frostnip: Warm the affected area, by resting inside a heated area such as a heated vehicle, or building.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

### **FROSTBITE**

Frostbite is a deeper freezing of the surface skin and is characterized by a white or waxy appearance. A mottled or blotchy appearance is sometimes seen. The frostbitten area often feels numb to the victim. Exposed skin areas and the extremities are the most likely parts to be affected.

Prevention of frostbite: Same as prevention of frostnip.

#### **Treatment of frostbite:**

If medical attention is not available, the part should be carefully warmed. If warming is done, it should be done by immersing the affected area in water that is approximately body temperature (100-105°F). Do not allow the affected body parts to touch the sides or bottom of the container (bath tub). Do not place pressure on the affected area.

Warming of the affected area will be painful to the victim. The presence of pain is usually a good indicator of successful rewarming. The warmed part should be wrapped in gauze and the victim transported to the nearest hospital for treatment.

### **HYPOTHERMIA**

Hypothermia is the general cooling of the entire body. Hypothermia is extremely unlikely unless the victim has had a long term exposure or has been immersed in a cold liquid. Hypothermia can be life threatening.

Symptoms of hypothermia include:

- Shivering
- Numbness
- Slowed breathing and pulse rate
- Drowsiness and an unwillingness to do even the simplest of activities
- Failing eyesight
- Incoordination
- Unconsciousness
- Freezing of body parts



Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

### Prevention of hypothermia

- \* Schedule work for warm times of year when possible
- \* Work during warmer times of day, when sun is shining
- \* Set up wind blocks to minimize the wind chill factor
- \* Layer clothing so that layers can be added/removed as necessary to prevent sweating and maintain body temperature.
- \* Change into dry clothing if it becomes wet
- \* Do not "overdress". Too much clothing causes sweating and reduces the effectiveness of your protective clothing.
- \* Monitor oral temperature periodically. If the oral temperature drops below 96.8 °F, remove the worker from field work. Get him to a warm building or vehicle so he can warm up. Do not allow the person to work until the body temperature is back to normal.
- \* Only perform emergency work when the wind chill index is below Minus 40 °F. Refer to 1990-1991 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. (This will allow 55 minutes of work before a break is required.)

### Monitoring

Monitoring should be performed at least once every four hours at temperatures below 68°F. The frequency of monitoring should be increased as the temperatures drop below freezing. The frequency of monitoring requires some judgement, and should reflect the work activity level required to perform each job function. Personnel performing sedentary functions such as documentation, will be more susceptible to cold stress than will physically active workers.

### Oral Temperature Action

97.6 - 99.6° F	Body temperature is approximately normal, keep on working.
97.5° F	Increase monitoring frequency to at least once per hour.
96.8° F	Remove employee from field work; move into heated environment
Below 96.8	Treat for mild hypothermia. Seek medical attention

All monitoring results must be recorded and maintained in the project files.

Site Name: Hardwood Range  
Location: Volk Field, Wisconsin  
Project #: 9661-04-92

### Treatment of Hypothermia

If the oral temperature drops below normal, it is likely that the person has other cold stress injuries such as frost bite. Take the individual to the nearest hospital for treatment.

If medical attention is not readily available:

- \* Remove wet clothing
- \* Dry the person
- \* Keep victim at rest
- \* Slowly warm core without warming legs
- \* If person is alert, give warm (not hot) liquids
- \* Transport to hospital as soon as possible

### NOTES:

1. If a person has recently been a victim of cold stress, he/she is very likely to remain more susceptible to cold for an indefinite period of time.
2. Bulky winter clothing is dangerous for drilling operations. Safe drilling operations recommend that loose fitting/bulky clothing be avoided because it snags on moving parts.
3. Cold can adversely affect monitoring instruments and the flexibility of personal protective clothing. Field personnel should check to be sure that respirators, monitoring equipment, and plastic covered coveralls will function as needed, prior to planning cold weather tasks.

**Appendix C**

**BLANK FORMS FOR CLOSURE ASSESSMENT FIELD ACTIVITIES**

**Advanced Sciences, Inc.**

Albuquerque

☐ Oak Ridge

6739 Academy Road, N.E.

165 Mitchell Road

Albuquerque, NM 87109-3345

**Oak Ridge, TN 37830-7919**

**65-60-828 (505)**

**(615) 483-1274**

10

405 Urban Street  
206105

Swile 401

Swine 401

**Lakewood,**

Lakewood, CO 80228

☐ **NOTIFY**

**Arlington**  
2007 North 15th Street

Suite 407

Suijo 407

Arlington, VA

Arlington, VA 22201-2827

# Chain of Custody

DATE \_\_\_\_\_ PAGE \_\_\_\_\_ OF \_\_\_\_\_

PAGE \_\_\_\_\_ OF \_\_\_\_\_

## ANALYSIS REQUEST

[illegible]

010-F34

**DISTRIBUTION:** WHITE, CANARY - LABORATORY PINK - ADVANCED SCIENCES, INC.

## Chain of Custody Form

**ADVANCED SCIENCES, INC.**  
165 Mitchell Road  
Oak Ridge, TN 37830-7919

LOCATION:

SAMPLE NO.

SIGNATURE

PRINT NAME AND TITLE (Inspector, Analyst or Technician)

SEAL BROKEN BY

DATE

Chain of Custody Seal (Label)

Revision Date: July 1992

## FIELD CHANGE REQUEST FORM

Field change No \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

Project \_\_\_\_\_

Project No. \_\_\_\_\_

Applicable Document \_\_\_\_\_

Description:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Reason for change:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Recommended disposition:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Impact on present and completed work:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Final disposition:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Request by:

Field/Project Manager: \_\_\_\_\_

Approvals

HAZWRAP Project Manager: \_\_\_\_\_

Note: The HAZWRAP Project Manager is notified of the need for the change in project cost, schedule direction or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

**Laboratory Reports and  
Chain-of-Custody Forms  
for July 28, 1993**



FILE COPY

August 12, 1993

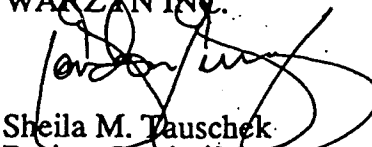
Mr. Joseph Hawk  
Advanced Science, Inc.  
165 Mitchell Road  
Oak Ridge, Tennessee 37830-7919

Dear Mr. Lawrence:

Enclosed are the analytical results and chain-of-custody for the samples collected July 28 and 29, 1993. Please feel free to call if you have any questions.

Sincerely,

WARZYN INC.

  
Sheila M. Tauschek  
Project Service Manager

SMT/dlk/GLG  
[var-ltrs]  
55005901-lab

THE PERFECT BALANCE  
BETWEEN TECHNOLOGY  
AND CREATIVITY

MADISON  
ONE SCIENCE COURT  
P.O. BOX 5385  
MADISON, WI 53705  
608/231-4747  
FAX 608/231-4777

CC: PROJECT FILES 9750.K-18.G





- A1 Elevated quantitation limit due to low sample volume.
- A2 Elevated quantitation limit necessary to overcome interference.
- A3 Elevated quantitation limit necessary to overcome difficult matrix.
- A4 Result should be considered estimated with possible low bias due to unknown interference.
- A5 Result should be considered estimated with possible low bias due to difficult matrix.
- A6 Result should be considered estimated with possible low bias as indicated by method QC.
- A7 Result should be considered estimated with possible high bias due to unknown interference.
- A8 Result should be considered estimated with possible high bias due to difficult matrix.
- A9 Result should be considered estimated with possible high bias as indicated by method QC.
- A10 Result should be considered estimated due to non-homogeneous sample matrix.
- A11 Sample received past recommended hold time.
- A12 Analysis requested past recommended hold time.
- A13 Initial analysis performed within hold time; confirmation analysis performed past recommended hold time. Results from repeat analysis are reported.
- A14 Initial analysis performed within hold time; necessary dilution performed past recommended hold time. Results from repeat analysis are reported.
- A15 Result should be considered estimated with possible high bias; analyte detected in method blank.
- A16 Elevated quantitation limit indicated by batch QC.
- M2 Total analysis performed; total concentration indicates that TCLP regulatory level could not be exceeded.
- W1 Sample contained <0.5% solids; filtered sample was analyzed as the TCLP extract.
- G1 Result should be considered estimated, concentration exceeds working calibration range.
- G2 Elevated quantitation limit due to the concentration of petroleum hydrocarbons in the sample.
- G3 Elevated quantitation limit due to the concentration of non-specific hydrocarbons in the sample.
- G4 Analyte coelutes with \_\_\_\_\_; result calculated from calibration standards in a 1:1 ratio of these two compounds.
- G5 Sample required extensive cleanup; Endrin Aldehyde is not recovered from these techniques.
- G6 Petroleum-type odor detected from this sample.
- G7 Elevated quantitation limit due to the concentration of PCBs in the sample.
- G8 Result should be considered estimated with possible high bias due to coelution with an additional hydrocarbon product.
- G9 Results are influenced by the presence of extraneous peaks which are not representative of petroleum hydrocarbon products.
- G10 Presence of one or more unidentified peaks eluting earlier than the retention time window.
- G11 Presence of one or more unidentified peaks eluting later than the retention time window.
- G12 Result is estimated. The method used is a screening procedure for this compound.
- G13 Measurement performed using test strips.
- G14 Measurement upon receipt performed using test strips.
- G15 n-Nitrosodiphenylamine decomposes in the GC inlet and cannot be separated from Diphenylamine.
- G16 Measurement upon receipt performed using test strips. Adjusted to pH <2.
- G17 Results are influenced by the presence of extraneous peaks which are not representative of petroleum hydrocarbon products. Final results pending GC/MS confirmation.

# METHOD REFERENCES

Analytes	Soil/Groundwater				Wastewater			
	ICP	Flame	Furnace	CV	ICP	Flame	Furnace	CV
Aluminium	6010	7020	-	-	200.7	202.1	-	-
Antimony	6010	7040	7041	-	200.7	-	204.2	-
Arsenic	6010	-	7060	-	200.7	-	206.2	-
Barium	6010	7080	7081	-	200.7	208.1	208.2	-
Beryllium	6010	7090	7091	-	200.7	210.1	210.2	-
Cadmium	6010	7130	7131	-	200.7	213.1	213.2	-
Calcium	6010	7140	-	-	200.7	215.1	-	-
Chromium, Total	6010	7190	7191	-	200.7	218.1	218.2	-
Cobalt	6010	7200	-	-	200.7	219.1	-	-
Copper	6010	7210	-	-	200.7	220.1	-	-
Iron	6010	7380	-	-	200.7	236.1	-	-
Lead	6010	7420	7421	-	200.7	239.1	239.2	-
Magnesium	6010	7450	-	-	200.7	242.1	-	-
Manganese	6010	7460	-	-	200.7	243.1	-	-
Mercury	-	-	-	7470 / 7471	-	-	-	245.1
Molybdenum	6010	7480	-	-	200.7	246.1	-	-
Nickel	6010	7520	-	-	200.7	249.1	-	-
Potassium	-	SM322B	-	-	-	SM322B	-	-
Selenium	6010	-	7740	-	200.7	-	270.2	-
Silver	6010	7760	7761	-	200.7	272.1	272.2	-
Sodium	6010	SM325B	-	-	200.7	SM325B	-	-
Strontium	6010	-	-	-	200.7	-	-	-
Thallium	6010	7840	7841	-	200.7	279.1	279.2	-
Tin	6010	-	-	-	200.7	-	-	-
Titanium	6010	-	-	-	200.7	-	-	-
Vanadium	6010	7910	7911	-	200.7	286.1	286.2	-
Zinc	6010	7950	-	-	200.7	289.1	-	-

SW846, "Test Methods for Evaluating Solid Waste", 3rd Ed., December 1987.

EPA-600, "Method for Chemical Analysis of Water and Wastes", March 1984.

Standard Method for the Examination of Water and Wastewater", 16th Edition, 1985.



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ONE SCIENCE COURT  
P.O. BOX 5385  
MADISON, WI 53705  
(608) 231 4747  
FAX (608) 231 4777

## METHOD REFERENCES

Analytes	Aqueous	Non-Aqueous
Acidity	305.2	-
Alkalinity, Total	310.1 / 310.2	-
Alkalinity, Phenolphthalein	SM2320	-
Alkalinity, Bicarbonate	SM2320	-
Alkalinity, Carbonate	SM2320	-
BOD-5 day	405.1	-
Boron	212.3	-
Carbon, Percent Organic	-	29-3.5.3
Carbon, Total Organic (TOC)	415.1	-
Chloride	325.2	-
Chlorine, Residual	330.3	-
Chromium, Hexavalent	SM3500D	-
COD	410.4	-
Cyanide, Total	335.3	9012
Cyanide, Amenable	335.1	9012
Cyanide, Reactive	SW7.3	SW7.3
Density	SM2710F	SM2710F
Flashpoint, Closed Cup	SW1010	SW1010
Flashpoint, Open Cup	ASTMD4206	ASTMD4206
Fluoride	340.2	-
Hardness, Total	130.1	-
Nitrogen, Ammonia	350.2	350.2
Nitrogen, Nitrate	353.2	-
Nitrogen, Nitrite	353.2	-
Nitrogen, Nitrate+Nitrite	353.2	-
Nitrogen, Total Kjeldahl (TKN)	351.3	351.3
Nitrogen, Total Organic (TON)	350.2 & 351.3	350.2 & 351.3
Oil & grease	413.1	9071
Paint Filter Test	9095	9095
pH	150.1	9045
Phenol, Total	420.2	9066
Phosphorus, Total	365.1	365.1
Phosphorus, Ortho	365.2	-
Solids, Total Dissolved	160.1	-
Solids, Total Suspended	160.2	-
Solids, Total	160.3	160.3
Solids, Total Volatile	160.4	-
Specific Conductance	120.1	-
Specific Weight	SM2710F	SM2710F
Sulfate	375.2	-
Sulfide, Total	376.1	9030
Sulfide, Reactive	SW7.3	SW7.3
Turbidity	180.1	-
TRPH	418.1 & 9073	418.1 & 9073

SW846, "Test Methods for Evaluating Solid Waste", 3rd Ed., December 1987.

EPA-600, "Methods for Chemical Analysis of Water and Wastes", March 1984.

Standard Methods for the Examination of Water and Wastewater", 17th Edition, 1989.

ASTM, Annual Book of American Society for Testing and Materials Standards, 1983, Volume 6.01.

Methods for Soil Analysis, 2nd Ed.



## METHOD REFERENCES

Compounds	Soil/Groundwater	Wastewater
Alcohol	8015*	8015*
BEXT	8020***	602
DRO	Modified DRO	Modified DRO
GRO	Modified GRO***	Modified GRO
Herbicides	8150	8150
Pesticides	8080	608
Pesticide/PCBs	8080	608
PCBs	8080**	608
PCBs	8080****	608
PCP Screen	8040****	8040****
PNA (GC/MS)	8270	8270
PNA (HPLC)	8310	8310
PVOCs	8020***	8020
SVOCs	8270	8270
TPH	D-3328-78*	D-3328-78*
TRPH	418.1 & 9073	418.1 & 9073
VOCs	8021	8021
VOCs	8010/8020***	601/602

SW846, "Test Methods for Evaluating Solid Waste", 3rd Ed., December 1987.

EPA-600, "Methods for Organic Chemical Analysis of Water and Wastes",  
March, 1984.

ASTM, "Annual Book of ASTM Standards", 1990.

Wisconsin DNR Modified 9073 TRPH, PUBL-SW-140, Wisconsin DNR,  
April 1992.

Wisconsin DNR Modified DRO, PUBL-SW-141, Wisconsin DNR, April 1992.

Wisconsin DNR Modified GRO, PUBL-SW-140, Wisconsin DNR, April 1992.

- \* With Modifications
- \*\* With Modifications for Oil Matrix
- \*\*\* With Modifications for Soil Gas Matrix
- \*\*\*\* With Modifications for Wipe Matrix



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INORGANIC REPORT  
ASI-HARDWOOD RANGE  
NEECEDAH WI  
Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Sample Date	Analysis Date
7145-0012	HR-GT-SS-02	Solids, Total	84.4	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0013	HR-GT-SN-02	Solids, Total	89.5	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0014	HR-GT-SD-02	Solids, Total	88.7	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0015	HR-GT-SL-02	Solids, Total	87.3	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0016	HR-GT-SW-02	Solids, Total	89.8	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0017	HR-GT-SE-02	Solids, Total	89.7	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0018	HR-DT-SW-02	Solids, Total	86.8	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0019	HR-DT-SE-02	Solids, Total	83.8	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0020	HR-DT-SS-02	Solids, Total	83	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0021	HR-DT-SN-02	Solids, Total	93.2	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0022	HR-DT-SN-02-D	Solids, Total	93.9	.5	Solid	%	28-JUL-93	30-JUL-93
7145-0023	HR-DT-SX- 01A,02A,03A,04A	Solids, Total	82.3	.5	Solid	%	29-JUL-93	30-JUL-93
7145-0024	HR-DT-SX- 01B,02B,03B,04B	Solids, Total	87.4	.5	Solid	%	29-JUL-93	30-JUL-93
7145-0025	HR-DT-SX- 01C,02C,03C,04C	Solids, Total	86.9	.5	Solid	%	29-JUL-93	30-JUL-93
7145-0027	HR-GT-WB- 01,02,03,04,05	Lead pH (upon receipt)	208 < 2	3 2	GroundH2O GroundH2O	ug/L S.U.	29-JUL-93 29-JUL-93	02-AUG-93
7145-0028	HR-DT-WB- 01,02,03,04,05	Lead pH (upon receipt)	23 < 2	3 2	GroundH2O GroundH2O	ug/L S.U.	29-JUL-93 29-JUL-93	02-AUG-93

Footnotes

Sample #	Test	Footnote
7145-0027	pH (upon receipt)	G14 - Measurement performed on nitric preserved bottle.
7145-0028	pH (upon receipt)	G14 - Measurement performed on nitric preserved bottle.

PETROLEUM VOLATILE ORGANIC (PVOC) REPORT

ASI-HARDWOOD RANGE

NEECEDAH WI

Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Footnotes	
7145-0023	HR-DT-SX- 01A,02A,03A,04A	Benzene	< .0061	.005	Solid	mg/kg		
		Methyl tert-butyl ether	< .0061	.005	Solid	mg/kg		
		Ethylbenzene	< .0061	.005	Solid	mg/kg		
		Toluene	< .0061	.005	Solid	mg/kg		
		1,2,4-Trimethylbenzene	.052	.005	Solid	mg/kg		
		1,3,5-Trimethylbenzene	.036	.005	Solid	mg/kg		
		m + p-Xylene	< .012	.01	Solid	mg/kg		
		o-Xylene	.018	.005	Solid	mg/kg		
		Sample Date:		29-JUL-93				
		Analysis Date:		02-AUG-93				
7145-0024	HR-DT-SX- 01B,02B,03B,04B	Benzene	< .0057	.005	Solid	mg/kg		
		Methyl tert-butyl ether	< .0057	.005	Solid	mg/kg		
		Ethylbenzene	.014	.005	Solid	mg/kg		
		Toluene	< .0057	.005	Solid	mg/kg		
		1,2,4-Trimethylbenzene	.18	.005	Solid	mg/kg		
		1,3,5-Trimethylbenzene	.8	.005	Solid	mg/kg		
		m + p-Xylene	.047	.01	Solid	mg/kg		
		o-Xylene	.014	.005	Solid	mg/kg		
		Sample Date:		29-JUL-93				
		Analysis Date:		02-AUG-93				
7145-0025	HR-DT-SX- 01C,02C,03C,04C	Benzene	< .0058	.005	Solid	mg/kg		
		Methyl tert-butyl ether	< .0058	.005	Solid	mg/kg		
		Ethylbenzene	.017	.005	Solid	mg/kg		
		Toluene	< .0058	.005	Solid	mg/kg		
		1,2,4-Trimethylbenzene	.087	.005	Solid	mg/kg		
		1,3,5-Trimethylbenzene	.18	.005	Solid	mg/kg		
		m + p-Xylene	.039	.01	Solid	mg/kg		
		o-Xylene	.023	.005	Solid	mg/kg		
		Sample Date:		29-JUL-93				
		Analysis Date:		02-AUG-93				

Note: Results in mg/kg are reported on a dry weight basis.



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PETROLEUM VOLATILE ORGANIC (PVOC) REPORT

ASI-HARDWOOD RANGE

NEECEDAH WI

Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Footnotes
7145-0027	HR-GT-WB- 01,02,03,04,05	Benzene	< 1	1	GroundH2O	ug/L	
		Methyl tert-butyl ether	< 1	1	GroundH2O	ug/L	
		Ethylbenzene	< 1	1	GroundH2O	ug/L	
		Toluene	< 1	1	GroundH2O	ug/L	
		1,2,4-Trimethylbenzene	< 1	1	GroundH2O	ug/L	
		1,3,5-Trimethylbenzene	5.6	1	GroundH2O	ug/L	
		m + p-Xylene	< 2	2	GroundH2O	ug/L	
		o-Xylene	3.2	1	GroundH2O	ug/L	
		pH	< 2	2	GroundH2O	S.U.	G13
		Sample Date:	29-JUL-93				
7145-0028	HR-DT-WB- 01,02,03,04,05	Benzene	< 1	1	GroundH2O	ug/L	
		Methyl tert-butyl ether	< 1	1	GroundH2O	ug/L	
		Ethylbenzene	3	1	GroundH2O	ug/L	
		Toluene	3.9	1	GroundH2O	ug/L	
		1,2,4-Trimethylbenzene	13	1	GroundH2O	ug/L	
		1,3,5-Trimethylbenzene	11	1	GroundH2O	ug/L	
		m + p-Xylene	10	2	GroundH2O	ug/L	
		o-Xylene	10	1	GroundH2O	ug/L	
		pH	< 2	2	GroundH2O	S.U.	G13
		Sample Date:	29-JUL-93				
7145-0029	HR-TB	Benzene	< 1	1	GroundH2O	ug/L	
		Methyl tert-butyl ether	< 1	1	GroundH2O	ug/L	
		Ethylbenzene	< 1	1	GroundH2O	ug/L	
		Toluene	< 1	1	GroundH2O	ug/L	
		1,2,4-Trimethylbenzene	< 1	1	GroundH2O	ug/L	
		1,3,5-Trimethylbenzene	< 1	1	GroundH2O	ug/L	
		m + p-Xylene	< 2	2	GroundH2O	ug/L	
		o-Xylene	< 1	1	GroundH2O	ug/L	
		pH	< 2	2	GroundH2O	S.U.	G13
		Sample Date:	27-JUL-93				
		Analysis Date:	30-JUL-93				

RL = Reporting Limit

WI Lab Certification ID#: 113138300

ck'd: *dlk* App'd: *ffm*  
Date App'd: 8/12/93



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GASOLINE RANGE ORGANICS (GRO)

ASI-HARDWOOD RANGE

NEECEDAH WI

Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7145-0001	HR-GT-SS-01	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	30-JUL-93					
7145-0002	HR-GT-SN-01	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	30-JUL-93					
7145-0003	HR-GT-SO-01	Gasoline Range Organics	550	10	Solid	mg/kg	None	G11
		Sample Date:	28-JUL-93					
		Extract Date:	02-AUG-93					
		Analysis Date:	02-AUG-93					
7145-0004	HR-GT-SL-01	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	31-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0005	HR-GT-SW-01	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	31-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0006	HR-GT-SE-01	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	31-JUL-93					
		Analysis Date:	31-JUL-93					

Note: Results in mg/kg are reported on a dry weight basis.

RL = Reporting Limit  
WI Lab Certification ID#: 113138300

Ck'd: *dlk* App'd: *gfm*  
Date App'd: 8/12/93





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GASOLINE RANGE ORGANICS (GRO)  
ASI-HARDWOOD RANGE  
NEECEDAH WI  
Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7145-0007	HR-DT-SW-01	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date: 28-JUL-93 Extract Date: 02-AUG-93 Analysis Date: 02-AUG-93						
7145-0008	HR-DT-SE-01	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date: 28-JUL-93 Extract Date: 02-AUG-93 Analysis Date: 02-AUG-93						
7145-0009	HR-DT-SS-01	Gasoline Range Organics	16	10	Solid	mg/kg	None	G11
		Sample Date: 28-JUL-93 Extract Date: 02-AUG-93 Analysis Date: 02-AUG-93						
7145-0010	HR-DT-SW-01	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date: 28-JUL-93 Extract Date: 02-AUG-93 Analysis Date: 02-AUG-93						
7145-0011	HR-DT-SW-01-D	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date: 28-JUL-93 Extract Date: 02-AUG-93 Analysis Date: 02-AUG-93						
7145-0023	HR-DT-SX- 01A,02A,03A,04A	Gasoline Range Organics	12	10	Solid	mg/kg	None	G11
		Sample Date: 29-JUL-93 Extract Date: 02-AUG-93 Analysis Date: 02-AUG-93						

Note: Results in mg/kg are reported on a dry weight basis.

RL = Reporting Limit  
WI Lab Certification ID#: 113138300

CR'd: *dlk* App'd: *gfm*  
Date App'd: *8/12/93*



GASOLINE RANGE ORGANICS (GRO)  
ASI-HARDWOOD RANGE  
NEECEDAH WI  
Project Number: 55005901

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Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7145-0024	HR-DT-SX- 01B,02B,03B,04B	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	29-JUL-93					
		Extract Date:	02-AUG-93					
		Analysis Date:	02-AUG-93					
7145-0025	HR-DT-SX- 01C,02C,03C,04C	Gasoline Range Organics	39	10	Solid	mg/kg	None	G11
		Sample Date:	29-JUL-93					
		Extract Date:	02-AUG-93					
		Analysis Date:	02-AUG-93					
7145-0026	HR-MB	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	02-AUG-93					
		Analysis Date:	02-AUG-93					

Note: Results in mg/kg are reported on a dry weight basis.

RL = Reporting Limit  
WI Lab Certification ID#: 113138300

Ch'd: *dlk* App'd: *gfm*  
Date App'd: 8/12/93

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## GASOLINE RANGE ORGANICS (GRO)

ASI-HARDWOOD RANGE

NEECEDAH WI

Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7145-0027	HR-GT-WB- 01,02,03,04,05	Gasoline Range Organics pH	< 100 < 2	100 2	GroundH2O GroundH2O	ug/L S.U.	None	G13
		Sample Date:	29-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	30-JUL-93					
7145-0028	HR-DT-WB- 01,02,03,04,05	Gasoline Range Organics pH	590 < 2	100 2	GroundH2O GroundH2O	ug/L S.U.	Detected	G11 G13
		Sample Date:	29-JUL-93					
		Extract Date:	02-AUG-93					
		Analysis Date:	02-AUG-93					



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DIESEL RANGE ORGANICS (DRO)

ASI-HARDWOOD RANGE

NEECEDAH WI

Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7145-0012	HR-GT-SS-02	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0013	HR-GT-SN-02	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0014	HR-GT-SD-02	Diesel Range Organics	710	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	02-AUG-93					
7145-0015	HR-GT-SL-02	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0016	HR-GT-SW-02	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0017	HR-GT-SE-02	Diesel Range Organics	10	10	Solid	mg/kg	None	G9
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					

Note: Results in mg/kg are reported on a dry weight basis.

RL = Reporting Limit  
WI Lab Certification ID#: 113138300

ck'd: *dlk* App'd: *[Signature]*  
Date App'd: 8/12/93



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DIESEL RANGE ORGANICS (DRO)  
ASI-HARDWOOD RANGE  
NEECEDAH WI  
Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7145-0018	HR-DT-SW-02	Diesel Range Organics	11	10	Solid	mg/kg	None	G9
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0019	HR-DT-SE-02	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0020	HR-DT-SS-02	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0021	HR-DT-SW-02	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0022	HR-DT-SW-02-D	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	28-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					
7145-0023	HR-DT-SX- 01A,02A,03A,04A	Diesel Range Organics	78	10	Solid	mg/kg	None	
		Sample Date:	29-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					

Note: Results in mg/kg are reported on a dry weight basis.

RL = Reporting Limit  
WI Lab Certification ID#: 113138300

Ch'd: *dlk* App'd: *gfm*  
Date App'd: 8/12/93



DIESEL RANGE ORGANICS (DRO)  
ASI-HARDWOOD RANGE  
NEECEDAH WI  
Project Number: 55005901

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Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7145-0024	HR-DT-SX- 01B,02B,03B,04B	Diesel Range Organics	680	10	Solid	mg/kg	None	
		Sample Date:	29-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	02-AUG-93					
7145-0025	HR-DT-SX- 01C,02C,03C,04C	Diesel Range Organics	110	10	Solid	mg/kg	None	
		Sample Date:	29-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	31-JUL-93					

Note: Results in mg/kg are reported on a dry weight basis.

RL = Reporting Limit  
WI Lab Certification ID#: 113138300

Ch'd: *dlk* App'd: *gfm*  
Date App'd: *8/12/93*

  
WARZYN

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DIESEL RANGE ORGANICS (DRO)  
ASI-HARDWOOD RANGE  
NEECEDAH WI  
Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7145-0027	HR-GT-WB- 01,02,03,04,05	Diesel Range Organics pH	830 > 2	100 2	GroundH2O GroundH2O	ug/L S.U.	Detected	G14
		Sample Date:	29-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	30-JUL-93					
7145-0028	HR-DT-WB- 01,02,03,04,05	Diesel Range Organics pH	4800 > 2	100 2	GroundH2O GroundH2O	ug/L S.U.	Detected	G14
		Sample Date:	29-JUL-93					
		Extract Date:	30-JUL-93					
		Analysis Date:	02-AUG-93					

PNA/PAH (HPLC) ORGANIC REPORT

ASI-HARDWOOD RANGE

NEECEDAH WI

Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Footnotes
7145-0027	HR-GT-WB- 01,02,03,04,05	Naphthalene	< 10	10	GroundH2O	ug/L	
		Acenaphthylene	< 10	10	GroundH2O	ug/L	
		Acenaphthene	< 18	18	GroundH2O	ug/L	
		Fluorene	< 2	2	GroundH2O	ug/L	
		Phenanthrene	< 1	1	GroundH2O	ug/L	
		Anthracene	< 1	1	GroundH2O	ug/L	
		Fluoranthene	< 2	2	GroundH2O	ug/L	
		Pyrene	< 1	1	GroundH2O	ug/L	
		Chrysene	< 1	1	GroundH2O	ug/L	
		Benzo(a)anthracene	< .1	.1	GroundH2O	ug/L	
		Benzo(b)fluoranthene	< .18	.18	GroundH2O	ug/L	
		Benzo(k)fluoranthene	< .1	.1	GroundH2O	ug/L	
		Benzo(a)pyrene	< .1	.1	GroundH2O	ug/L	
		Indeno(1,2,3-cd)pyrene	< .1	.1	GroundH2O	ug/L	
		Dibenzo(a,h)anthracene	< .2	.2	GroundH2O	ug/L	
		Benzo(g,h,i)perylene	< .2	.2	GroundH2O	ug/L	
		1-Methylnaphthalene	< 10	10	GroundH2O	ug/L	
		2-Methylnaphthalene	< 10	10	GroundH2O	ug/L	

Sample Date: 29-JUL-93

Extract Date: 30-JUL-93

Analysis Date: 30-JUL-93

RL = Reporting Limit

WI Lab Certification ID#: 113138300

Ck'd: *CLK* App'd: *RFM*  
Date App'd: 8/12/93





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PNA/PAH (HPLC) ORGANIC REPORT  
ASI-HARDWOOD RANGE  
NEECEDAH WI  
Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Footnotes
7145-0028	HR-DT-WB- 01,02,03,04,05	Naphthalene	< 10	10	GroundH2O	ug/L	
		Acenaphthylene	< 10	10	GroundH2O	ug/L	
		Acenaphthene	< 18	18	GroundH2O	ug/L	
		Fluorene	< 2	2	GroundH2O	ug/L	
		Phenanthrene	1.4	1	GroundH2O	ug/L	
		Anthracene	< 1	1	GroundH2O	ug/L	
		Fluoranthene	4	2	GroundH2O	ug/L	
		Pyrene	4.5	1	GroundH2O	ug/L	
		Chrysene	< 1	1	GroundH2O	ug/L	
		Benzo(a)anthracene	1.2	.1	GroundH2O	ug/L	
		Benzo(b)fluoranthene	< .18	.18	GroundH2O	ug/L	
		Benzo(k)fluoranthene	< .1	.1	GroundH2O	ug/L	
		Benzo(a)pyrene	< .1	.1	GroundH2O	ug/L	
		Indeno(1,2,3-cd)pyrene	< .1	.1	GroundH2O	ug/L	
		Dibenzo(a,h)anthracene	< .2	.2	GroundH2O	ug/L	
		Benzo(g,h,i)perylene	< .2	.2	GroundH2O	ug/L	
		1-Methylnaphthalene	< 10	10	GroundH2O	ug/L	
		2-Methylnaphthalene	< 10	10	GroundH2O	ug/L	

Sample Date: 29-JUL-93  
Extract Date: 30-JUL-93  
Analysis Date: 30-JUL-93

Ck'd: *dlk* App'd: *8/1/93*  
Date App'd: *8/1/93*

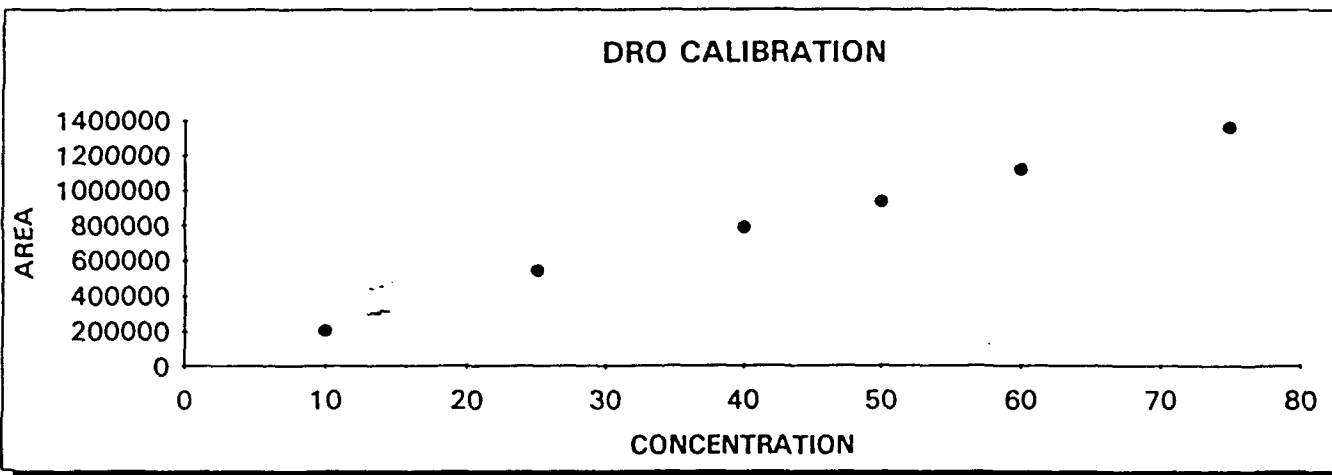
**WISCONSIN LUST PROGRAM**  
**DIESEL RANGE ORGANICS ANALYSIS (DRO)**  
**CALIBRATION SHEET**  
**WARZYN ANALYTICAL SERVICES**

C#: 55005901  
 Date Analyzed: 7/30/93  
 Batch #: 24410  
 STDS. ON B# 24269

Date Extracted: 7/30/93  
 Logbook/Page: 3/59,60,61  
 Calc. by/Date: CMK/8/2/93

AREA	CONCENTRATION in ug/ml
1358249	75
1113727	60
933834	50
785911	40
543538	25
203370	10

SLOPE	5.72039E-05
INTERCEPT	-3.75147399
R2	0.995457385
R	0.998



**CONTINUING CALIBRATION STANDARDS**

CCV #	AREA	TRUE CONC.	MEASURED CONC.	%R	PASS/FAIL
1	541192	25	27.2	108.8%	PASS
2	542260	25	27.3	109.1%	PASS
3	545658	25	27.5	109.8%	PASS
4	536593	25	26.9	107.8%	PASS
5	505692	25	25.2	100.7%	PASS
6	529068	25	26.5	106.1%	PASS
7					
8					
9					
10					
11					
12					
13					
14					
15					

**WISCONSIN LUST PROGRAM**  
**DIESEL RANGE ORGANICS ANALYSIS (DRO)**  
**DRO SPIKE/DUPLICATE - SOLID**  
**WARZYN ANALYTICAL SERVICES**

C#: 55005901  
Date Analyzed: 7/30/93  
Batch #: 24410  
Date Extracted: 7/30/93  
Logbook/Page: 3/59,60,61  
Calc. by/Date: CMK/8/2/93

**DRO SPIKE**

AREA	SPIKE CONC. UG/ML	MEASURED CONC. UG/ML	%R
988145	8.0	10.6	131.9%

**DRO SPIKE DUPLICATE**

AREA	SPIKE CONC. UG/ML	MEASURED CONC. UG/ML	%R
695078	8.0	7.2	90.0%

Reviewed By/Date: SW 8/2/93  
Approved By/Date: CMK 8/2/93

**WISCONSIN LUST PROGRAM**  
**DIESEL RANGE ORGANICS ANALYSIS (DRO)**  
**DRO SPIKE/DUPLICATE - SOLID**  
**WARZYN ANALYTICAL SERVICES**

C#: 55005901  
Date Analyzed: 7/30/93  
Batch #: 24410  
Date Extracted: 7/30/93  
Logbook/Page: 3/59(60)61  
Calc. by/Date: CMK/8/2/93

**DRO SPIKE**

AREA	SPIKE CONC. UG/ML	MEASURED CONC. UG/ML	%R
708083	8.0	7.4	91.9%

**DRO SPIKE DUPLICATE**

AREA	SPIKE CONC. UG/ML	MEASURED CONC. UG/ML	%R
749826	8.0	7.8	97.9%

Reviewed By/Date: 8/2/93  
Approved By/Date: RAA 8/2/93

**WISCONSIN LUST PROGRAM**  
**DIESEL RANGE ORGANICS ANALYSIS (DRO)**  
**DRO SPIKE/DUPLICATE - WATER**  
**WARZYN ANALYTICAL SERVICES**

C#: 55005901  
Date Analyzed: 7/30/93  
Batch #: 24410  
Date Extracted: 7/30/93  
Logbook/Page: (3/59) 60, 61  
Calc. by/Date: CMK/8/2/93

**DRO SPIKE**

AREA	SPIKE CONC. UG/ML	MEASURED CONC. UG/ML	%R
817164	200	215.0	107.5%

**DRO SPIKE DUPLICATE**

AREA	SPIKE CONC. (UG/ML)	MEASURED CONC. (UG/ML)	%R
892868	200	236.6	118.3%

Reviewed By/Date: Sen 8/2/93  
Approved By/Date: BAB 8/2/93

Method Blank Summary Form

WARZYN, INC.

Polynuclear Aromatic Hydrocarbons  
Method 8310--HPLC

Matrix (Soil/Water) : WATER  
Batch # : 24408

COMPOUNDS	Reporting Limit ug/L	BLANK ID 7/30/93	BLANK ID	BLANK ID	BLANK ID	BLANK ID
Naphthalene	10	<10				
Acenaphthylene	10	<10				
Acenaphthene	18	<18				
Fluorene	2.0	<2.0				
Phenanthrene	1.0	<1.0				
Anthracene	1.0	<1.0				
Fluoranthene	2.0	<2.0				
Pyrene	1.0	<1.0				
Benzo(a)anthracene	0.10	<0.10				
Chrysene	1.0	<1.0				
Benzo(b)fluoranthene	0.18	<0.18				
Benzo(k)fluoranthene	0.10	<0.10				
Benzo(a)pyrene	0.10	<0.10				
Indeno(123cd)pyrene	0.10	<0.10				
Dibenzo(ah)anthracene	0.20	<0.20				
Benzo(ghi)perylene	0.20	<0.20				
1-MethylNaphthalene	10	<10				
2-MethylNaphthalene	10	<10				

CALC. BY: W 8-2-93  
CHECKED BY: JL 8-7-93  
FINALED BY: JL 8-7-93

NR = NOT REQUESTED  
< RL = < Reporting Limit

Matrix Spike/Matrix Spike Duplicate Form

WARZYN, INC.

Polynuclear Aromatic Hydrocarbons  
Method 8310--HPLC

BATCH #: 24408

Laboratory #: LFB 7/30/93

Amount Extracted : 0.5 L

Extract Volume (ml) : 2.0 ml

Matrix (Soil/Water) : WATER

Date Extracted : 7/30/93

Spike Soln. Ref. : LOG69,P 24

CMPD CODE (PCODE)	COMPOUND	Spike Added ug/L	Sample Conc. ug/L	Matrix Spike Conc. ug/L	Percent Recovery (%)	Matrix Spike Duplicate Conc. ug/L	Percent Recovery (%)	Percent RPD (%)
NAPH	Naphthalene	40	0	37	92.16	36.8	92.02	0.15
ACEN	Acenaphthylene	80	0	78	97.94	78.3	97.925	0.02
ACE	Acenaphthene	40	0	38	95.49	38.3	95.87	0.40
FLUO	Fluorene	8	0	7.9	98.15	7.9	98.65	0.51
PHEN	Phenanthrene	4	0	4.6	115.5	4.7	117.3	1.55
ANTH	Anthracene	4	0	3.9	98.9	4.0	100.4	3.55
FLAN	Fluoranthene	8	0	8.6	107.35	8.8	110.45	2.85
PYRENE	Pyrene	4	0	4.0	101	3.9	98.5	2.51
BAA	Benzo(a)anthracene	4	0	3.9	96.5	4.0	100.2	3.76
CHRY	Chrysene	4	0	3.7	93.4	3.8	95.1	1.80
BBF	Benzo(b)fluoranthene	8	0	7.6	94.45	7.6	95.2	0.79
BKF	Benzo(k)fluoranthene	4	0	3.7	93.5	4.0	98.9	5.61
BAP	Benzo(a)pyrene	4	0	4.0	100.1	4.2	103.8	3.63
DIBENZ	Dibenz(a,h)anthracene	8	0	6.1	75.85	6.7	84.05	10.52
BGHI	Benzo(g,h,i)perylene	8	0	8.2	77.15	7.1	88.7	13.93
IDENO	Indeno(1,2,3cd)pyrene	4	0	3.2	78.8	3.4	85.2	7.80

a -- Recovery outside of established limits.

b -- Relative percent difference (RPD) limit exceeded.

0 OF 32 SPIKING COMPOUNDS OUTSIDE OF ESTABLISHED RANGE

Calc. By : VLL 8-2-93

Chk'd By : 8-2-93

Finald By : 8-2-93

CALC. BY: V. H. 8-2-93  
CHECKED BY: D. C. 1-1-93  
FINALED BY: W. C. 1-1-93



10 Jul 93 03:30 PM

Current Method: C:\HPCHEM\1\METHODS\VYDAC.M\

Dual Signal Method 1 of ADC1

# Calibration Table

Pk#	RT	Lvl	UG/ML	Amt/Hght	Ref Istd I#	Name
1	5.395	1	0.5	6.6587e-003	1	CARBAZOLE
		2	1.0	6.9305e-003		
		3	2.0	7.3406e-003		
		4	4.0	8.1784e-003		
		5	8.0	9.2054e-003		
2	6.384	1	2.5	7.3365e-002	1	NAPHTHALENE
		2	5.0	7.3312e-002		
		3	10.0	0.0773		
		4	20.0	8.3957e-002		
		5	40.0	9.0509e-002		
3	7.618	1	2.5	4.7493e-002	1	1-METHYLNAPHTHALENE
		2	5.0	5.0016e-002		
		3	10.0	0.05398		
		4	20.0	6.0509e-002		
4	7.870	1	2.5	3.4008e-002	1	2-METHYLNAPHTHALENE
		2	5.0	3.5943e-002		
		3	10.0	3.9581e-002		
		4	20.0	4.4308e-002		
5	8.095	1	2.5	3.4338e-002	1	ACENAPHTHENE
		2	5.0	3.5812e-002		
		3	10.0	3.8539e-002		
		4	20.0	4.1553e-002		
6	8.361	1	0.5	1.0069e-002	1	FLUORENE
		2	1.0	1.0396e-002		
		3	2.0	1.0912e-002		
		4	4.0	1.1339e-002		
		5	8.0	1.2238e-002		
7	8.961	1	0.25	4.5847e-003	1	PHENANTHRENE
		2	0.5	4.6081e-003		
		3	1.0	4.663e-003		
		4	2.0	4.8107e-003		
		6	10.0	5.9063e-003		
8	9.176	1	25.0	1.45787	1	DECAFLUOROBIPHENYL
		2	50.0	1.44093		
		3	100.0	1.46996		
		4	200.0	1.53829		
		6	1000.0	2.15299		
9	9.577	1	0.25	2.3904e-003	1	ANTHRACENE
		2	0.5	2.4475e-003		
		3	1.0	2.5122e-003		
		4	2.0	2.6769e-003		
		5	4.0	2.9988e-003		
10	10.149	1	0.5	7.4205e-003	1	FLUOROANTHENE
		2	1.0	7.3777e-003		
		3	2.0	7.4408e-003		
		4	4.0	7.6563e-003		
		5	8.0	8.1736e-003		
11	10.556	1	0.25	9.1441e-003	1	PYRENE
		2	0.5	8.9526e-003		
		3	1.0	8.836e-003		
		4	2.0	9.0186e-003		
		5	4.0	9.2072e-003		
		6	10.0	1.0065e-002		
12	11.857	1	0.025	2.4767e-003	1	BENZO(A)ANTHRACENE
		2	0.05	2.4172e-003		
		3	0.1	2.3552e-003		

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Current Method: C:\HPCHEM\1\METHODS\VYDAC.M\

Qual Signal Method 1 of ADC1

		4	0.2	2.3891e-003	
		5	0.4	2.3949e-003	
		6	1.0	2.432e-003	
13	12.234	1	0.25	6.2578e-003	1 CHRYSENE
		2	0.5	6.2572e-003	
		3	1.0	6.2094e-003	
		4	2.0	6.3559e-003	
		5	4.0	6.436e-003	
		6	10.0	6.8082e-003	
14	13.252	1	0.05	7.9533e-004	1 BENZO(B) FLUORANTHENE
		2	0.1	8.0155e-004	
		3	0.2	8.006e-004	
		4	0.4	8.0847e-004	
		5	0.8	8.1437e-004	
15	13.958	1	0.025	2.7515e-004	1 BENZO(K) FLUORANTHENE
		2	0.05	2.7382e-004	
		3	0.1	2.7462e-004	
		4	0.2	2.787e-004	
		5	0.4	2.8059e-004	
16	14.555	1	0.025	3.8979e-004	1 BENZO(A) PYRENE
		2	0.05	3.8812e-004	
		3	0.1	3.8539e-004	
		4	0.2	3.8486e-004	
		5	0.4	3.8875e-004	
17	15.779	1	0.05	3.1651e-003	1 DIBENZO(AH) ANTHRACEN...
		2	0.1	3.1958e-003	
		3	0.2	3.1695e-003	
		4	0.4	3.1961e-003	
		5	0.8	3.1776e-003	
		6	2.0	3.1572e-003	
18	16.507	1	0.05	1.1788e-003	1 BENZO(GHI) PERYLENE
		2	0.1	1.187e-003	
		3	0.2	1.1704e-003	
		4	0.4	1.1717e-003	
		5	0.8	1.1791e-003	
		6	2.0	1.1909e-003	
19	17.558	1	0.025	1.3413e-003	1 INDENO(123-CD) PYRENE
		2	0.05	1.3715e-003	
		3	0.1	1.3645e-003	
		4	0.2	1.3725e-003	
		5	0.4	1.3689e-003	
		6	1.0	1.3572e-003	

Calibration Table

k#	RT	Lvl	UG/ML	Amt/Hght	Ref Istd I#	Name
1	5.332	1	0.5	0.17239	1	CARBAZOLE
		2	1.0	0.17918		
		3	2.0	0.18136		
		4	4.0	0.18474		
		5	8.0	0.19352		
		6	20.0	0.20527		
2	6.327	1	2.5	0.60312	1	NAPHTHALENE
		2	5.0	0.58848		
		3	10.0	0.58698		
		4	20.0	0.5946		
		5	40.0	0.60328		
		6	100.0	0.61263		
3	7.130	1	5.0	0.76934	1	ACENAPHTHYLENE
		2	10.0	0.75196		
		3	20.0	0.75137		
		4	40.0	0.76395		
		5	80.0	0.77515		
		6	200.0	0.7892		
4	7.561	1	2.5	0.71949	1	1-METHYLNAPHTHALENE
		2	5.0	0.70644		
		3	10.0	0.70015		
		4	20.0	0.70785		
		5	40.0	0.71649		
		6	100.0	0.73238		
5	7.810	1	2.5	0.51684	1	2-METHYLNAPHTHALENE
		2	5.0	0.51172		
		3	10.0	0.51253		
		4	20.0	0.51824		
		5	40.0	0.52856		
		6	100.0	0.52925		
6	8.034	1	2.5	1.12029	1	ACENAPHTHENE
		2	5.0	1.10195		
		3	10.0	1.0964		
		4	20.0	1.11402		
		5	40.0	1.12266		
		6	100.0	1.13618		
7	8.306	1	0.5	9.4593e-002	1	FLUORENE
		2	1.0	9.3139e-002		
		3	2.0	9.3164e-002		
		4	4.0	9.5558e-002		
		5	8.0	0.09499		
		6	20.0	9.5708e-002		
8	8.913	1	0.25	3.9378e-002	1	PHENANTHRENE
		2	0.5	4.0158e-002		
		3	1.0	0.03969		
		4	2.0	3.9605e-002		
		5	4.0	4.0822e-002		
		6	10.0	4.1251e-002		
9	9.130	7	50.0	3.6671e-002	1	DECAFLUOROBIPHENYL
		1	25.0	1.86923		
		2	50.0	1.83975		
		3	100.0	1.82981		
		4	200.0	1.83773		
		5	400.0	1.8675		
10	9.522	6	1000.0	1.8997	1	ANTHRACENE
		1	0.25	1.0094e-002		

Current Method: C:\HPCHEM\1\METHODS\VYDAC.M\

## Dual Signal Method 2 of VWD1A

		2	0.5	1.9227e-002	
		3	1.0	0.01936	
		4	2.0	0.02025	
		5	4.0	2.2359e-002	
11	10.095	1	0.5	0.14682	1 FLUOROANTHENE
		2	1.0	0.14302	
		3	2.0	0.14303	
		4	4.0	0.14432	
		5	8.0	0.1451	
		6	20.0	0.14887	
		7	100.0	0.13876	
12	10.512	1	0.25	0.15598	1 PYRENE
		2	0.5	0.16049	
		3	1.0	0.15737	
		4	2.0	0.15825	
		5	4.0	0.16325	
		6	10.0	0.15995	
13	11.808	1	0.025	5.9654e-002	1 BENZO (A) ANTHRACENE
		2	0.05	6.2291e-002	
		3	0.1	5.9853e-002	
		4	0.2	5.9494e-002	
		5	0.4	0.05821	
		6	1.0	5.5661e-002	
		7	5.0	5.4138e-002	
14	12.184	1	0.25	3.4089e-002	1 CHRYSENE
		2	0.5	3.4133e-002	
		3	1.0	3.3916e-002	
		4	2.0	3.4268e-002	
		5	4.0	0.03484	
		6	10.0	3.6812e-002	
15	13.191	1	0.05	5.3093e-002	1 BENZO (B) FLUORANTHENE
		2	0.1	5.3709e-002	
		3	0.2	5.3799e-002	
		4	0.4	5.3678e-002	
		5	0.8	5.3312e-002	
		6	2.0	5.4384e-002	
		7	10.0	5.4754e-002	
16	13.892	1	0.025	0.10065	1 BENZO (K) FLUORANTHENE
		2	0.05	9.5193e-002	
		3	0.1	9.6653e-002	
		4	0.2	9.7687e-002	
		5	0.4	9.4723e-002	
		6	1.0	9.5516e-002	
17	14.506	1	0.025	7.3599e-002	1 BENZO (A) PYRENE
		2	0.05	7.3327e-002	
		3	0.1	7.2935e-002	
		4	0.2	7.2746e-002	
		5	0.4	7.4146e-002	
		6	1.0	7.3821e-002	
		7	5.0	7.7162e-002	
18	15.733	1	0.05	0.38089	1 DIBENZO (AH) ANTHRACEN...
		2	0.1	0.37043	
		3	0.2	0.37216	
		4	0.4	0.37376	
		5	0.8	0.37071	
		6	2.0	0.36871	
19	16.461	1	0.05	0.2476	1 BENZO (GHI) PERYLENE
		2	0.1	0.24851	
		3	0.2	0.24663	
		4	0.4	0.24719	

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Current Method: C:\HPCHEM\1\METHODS\VYDAC.M\

ual Signal Method 2 of VWD1A

	5	0.8	0.24621
	6	2.0	0.24613
	7	10.0	0.25208
20 17.513	1	0.025	0.12636
	2	0.05	0.12225
	3	0.1	0.12394
	4	0.2	0.12419
	5	0.4	0.12411
	6	1.0	0.12272

1 INDENO(123-CD)PYRENE

## Sample Information

Date Sampled 7/29/93  
Date of Analysis 7/2/93

## Sample Prep Information:

Date Digested 7/30/93 By ECO  
Digestion SOP# WNEPDIG  
Balance Used

ENTERED

Lab #	Sample Matrix	Conc. ug/L	Manual Dilution	Conc. ug/L	Conc. mg/L	Digested Dilution	Final Conc. Units:
						50ml / (50ml)	g/L
Dig. Blk		0.85	-	17.0			10.003
Dig. Std *		19.65	-	19.65/20			98.2%
7145-0027	6W	41.71	1/5	208.55			0.208
7145-0027 SPK *		48.84	1/5	244.20			0.244 - 0.208 0.020
7145-0028		22.83	-				0.023
7145-0028 DUP	↓	22.48	-			↓	0.022
10.0 STD		10.74	-	10.74/10.0			107.4%
7145-0027 +		39.61	1/10 +	39.61/20			93.5%
50.0 STD		49.78	-	49.78/50.0			98.8%

Comments:

\* 20 Pb

+ 0.200 mg/L Pb added to 1.0 ml sample  
 for 0.020 mg/L Pb (substituted for 0.5 pl. line  
 to diff. style conc.)

Reviewed by: SS

Date: 8/2/93



## INJECT RATE

1

SAMPLE	CONC ug/l	%RSD	MEAN ABS	READINGS	
BLANK	0.00		-0.012	-0.011	-0.013
STANDARD 1	3.00	8.2	0.022	0.021	0.023
BLANK	0.00		0.010	0.009	0.011
STANDARD 1	3.00	7.7	0.018	0.017	0.019
STANDARD 2	10.00	0.0	0.060	0.060	0.060
STANDARD 3	20.00	0.3	0.117	0.117	0.117
STANDARD 4	50.00	0.7	0.276	0.275	0.278
5.00 std.	5.20	7.4	0.032	0.033	0.030
Blank	-0.10	83.5	-0.001	-0.000	-0.001
WS378 #5	33.94	2.1	0.192	0.184	0.190
Std. Blk.	0.85	99.9	0.005	0.009	0.001
Std. Std.	19.65	0.9	0.115	0.114	0.116
7145-0027	OVER	2.8	0.920	0.902	0.939
7145-0027 So	OVER	16.9	0.883*	0.778	0.984
7145-0028	22.83	2.1	0.133	0.135	0.131
7145-0028 Do	22.48	0.7	0.131	0.131	0.130
10.0 std.	10.34	0.8	0.062	0.062	0.063
BLANK	0.00		0.002	0.002	0.001
10.0 std.	19.71	0.5	0.115	0.115	0.116
7145-0027 1/5	41.71	0.1	0.233	0.233	0.230
7145-0027 So	48.84	0.0	0.270	0.270	0.270
7145-0027+ 1/10	39.61	0.0	0.222	0.220	0.221
10.0 std.	49.38	0.5	0.273	0.274	0.272
Blank	0.42	99.9	0.003	0.003	0.001

**WISCONSIN LUST PROGRAM**  
**GASOLINE RANGE ORGANICS ANALYSIS (GRO)**  
**DATA SHEET - WATER**  
**WARZYN ANALYTICAL SERVICES**

C#: \_\_\_\_\_  
 Batch #: 24422  
 Logbook/Page: 5890/00-02  
 Calc. by/Date: A.J.K./8-3-93

		Results in ug/L					
Date Analyzed:		7/30/93	8/1/93	8/2/93			
Warzyn Sample #		BLK 7/30/93	BLK 8/1/93	BLK 8/2/93			
Sample I.D.		METHOD	METHOD	METHOD			
		BLANK	BLANK	BLANK			
Dilution Factor *		1	1	1			
Hydrocarbon	Reporting Limit						
GRO	100	<100	<100	<100			
pH							
Odor		NO	NO	NO			

\* Multiply reporting limits by dilution factor to obtain corrected sample-specific quantitation limits.

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Method Reference: LUST Modified GRO, WI DNR

Reviewed by: CAK 8-3-93  
 Approved by: pmL 08-03-93



# WISCONSIN GRO SOIL COMPONENT SPIKE FORM

Batch # : 24422  
Date Analyzed : 7/30/93  
Instrument ID : 5890  
e Solution Lot 3 : ME1521

## GRO SOIL SPIKE #1

Amount Spiked (mg/Kg)	Total Response (Area)	Spike Concentration (mg/Kg)	Percent Recovery (%)
50	8376774	32.77	65.5% *

## GRO SOIL SPIKE #2

Amount Spiked (mg/Kg)	Total Response (Area)	Spike Concentration (mg/Kg)	Percent Recovery (%)	Percent Difference (%D)
50	9509358	37.2	74.4%	12.7%

## QC Limits

Percent Recovery : 69 - 158 %

RPD Limits : +/- 20%

\* = Outside QC Limits

Calculated By/Date : QJZ / 8-2-93

Reviewed By/Date : CRK 8-3-97

Approved By/Date : \_\_\_\_\_

# WISCONSIN GRO SOIL COMPONENT SPIKE FORM

Batch # : 24422  
 Date Analyzed : 8/1/93  
 Instrument ID : 5890  
 e Solution Lot 3 : ME1521

## GRO SOIL SPIKE #1

Amount Spiked (mg/Kg)	Total Response (Area)	Spike Concentration (mg/Kg)	Percent Recovery (%)
50	9081692	35.53	71.1%

## GRO SOIL SPIKE #2

Amount Spiked (mg/Kg)	Total Response (Area)	Spike Concentration (mg/Kg)	Percent Recovery (%)	Percent Difference (%D)
50	9859825	38.57	77.1%	8.2%

### QC Limits

Percent Recovery : 69 - 158 %

RPD Limits : +/- 20%

\* = Outside QC Limits

Calculated By/Date : A.P.K. 18-2-93  
 Reviewed By/Date : CAK 4-3-93  
 Approved By/Date : MLC 08-03-93

# Varian SpectraA 300/400 Zeeman Report

Instrument: V 400Z A  
Warzyn Inc., Madison, Wisconsin

OPERATOR: HJM  
DATE: 8/2/93  
BATCH: # 24416

PROGRAM 22 Pb

INSTRUMENT MODE	ABSORBANCE
CALIBRATION MODE	CONCENTRATION
MEASUREMENT MODE	PEAK AREA
LAMP POSITION	1
LAMP CURRENT (mA)	4
SLIT WIDTH (nm)	0.5
SLIT HEIGHT	NORMAL
WAVELENGTH (nm)	283.3
SAMPLE INTRODUCTION	SAMPLER PREMIXED
TIME CONSTANT	0.05
MEASUREMENT TIME (sec)	1.0
REPLICATES	2
BACKGROUND CORRECTION	ON
MAXIMUM ABSORBANCE	1.40

FURNACE PARAMETERS					
STEP NO.	TEMPERATURE (C)	TIME (sec)	GAS FLOW (L/min)	GAS TYPE	READ COMMAND
1	220	1.0	3.0	NORMAL	NO
2	240	35.0	3.0	NORMAL	NO
3	240	5.0	3.0	NORMAL	NO
4	650	5.0	3.0	NORMAL	NO
5	650	15.0	3.0	NORMAL	NO
6	650	1.0	0.0	NORMAL	NO
7	2200	0.9	0.0	NORMAL	YES
8	2200	2.0	0.0	NORMAL	YES
9	2500	2.0	3.0	NORMAL	NO

SAMPLER PARAMETERS		
VOLUMES (µL)		
	SOLUTION	BLANK
BLANK	--	20
STANDARD 1	20	0
STANDARD 2	20	0
STANDARD 3	20	0
STANDARD 4	20	0
SAMPLE	20	0

RECALIBRATION RATE 0  
RESLOPE RATE 0

MULTIPLE INJECT NO      HOT INJECT YES      PRE INJECT NO  
                                 TEMPERATURE 125

# WISCONSIN GRO WATER COMPONENT SPIKE FORM

Batch # : 24422  
Date Analyzed : 7/30/93  
Instrument ID : 5890  
e Solution Lot 3 : ME 1522

## GRO COMPONENT SPIKE

Amount Spiked (ug/l)	Total Response (Area)	Spike Concentration (ug/L)	Percent Recovery (%)
100	1214631	95	95.0%

## GRO COMPONENT SPIKE DUPLICATE

Amount Spiked (ug/l)	Total Response (Area)	Spike Concentration (ug/L)	Percent Recovery (%)	Percent Difference (%)
100	1353826	106	106.0%	10.9%

## QC Limits

Percent Recovery : 81 -145 %  
Percent Difference : +/- 20 %

Calculated By/Date : QJX/8-2-93  
Reviewed By/Date : CRK 8-3-93  
Approved By/Date : PML 08-03-93

# WISCONSIN GRO WATER COMPONENT SPIKE FORM

Batch # : 24422  
Date Analyzed : 8/2/93  
Instrument ID : 5890  
Solution Lot 3 : ME 1522

## GRO COMPONENT SPIKE

Amount Spiked (ug/l)	Total Response (Area)	Spike Concentration (ug/L)	Percent Recovery (%)	
100	866483	68	68.0%	*

## GRO COMPONENT SPIKE DUPLICATE

Amount Spiked (ug/l)	Total Response (Area)	Spike Concentration (ug/L)	Percent Recovery (%)	Percent Difference (%)	
100	1071253	84	84.0%	21.1%	*

## QC Limits

Percent Recovery : 81 -145 %  
Percent Difference : +/- 20 %

Calculated By/Date : AKL/8-3-93  
Reviewed By/Date : CAK 8-3-93  
Approved By/Date : KML 08-03-93

# WISCONSINGRO SURROGATE RECOVERY FORM

Batch # : 24422  
 Dates of Analysis: 7/30-8/2/93  
 Instrument ID : 5890  
 Calc. by/ Date: A.J.K./8-3-93

	Sample Number	Matrix	Total Surrogate Response (Area)	Conc. (mg/L)	Percent Recovery (%)	PASS/*FAIL*
1)	BLANK 7/30/93	WATER	582862	0.087	89.1	PASS
2)	BLANK 8/1/93	WATER	607889	0.091	90.8	PASS
3)	7145-0001	"SOIL"	725340	0.107	107	PASS
4)	7145-0002	"SOIL"	571937	0.086	85.8	PASS
5)	7145-0003	"SOIL"	686880	0.102	102	PASS
6)	7145-0003R	"SOIL"	740364	0.109	109	PASS
7)	7145-0004	"SOIL"	662276	0.098	98.4	PASS
8)	7145-0005	"SOIL"	625430	0.093	93.3	PASS
9)	7145-0006	"SOIL"	673150	0.100	100	PASS
10	7145-0007	"SOIL"	701507	0.104	104	PASS
11	7145-0008	"SOIL"	695897	0.103	103	PASS
12	7145-0009	"SOIL"	723538	0.107	107	PASS
13	7145-0010	"SOIL"	743717	0.110	110	PASS
14	7145-0011	"SOIL"	702506	0.104	104	PASS
15	7145-0023	"SOIL"	746475	0.110	110	PASS
16	7145-0024	"SOIL"	711270	0.105	105	PASS
17	7145-0025	"SOIL"	708774	0.105	105	PASS
18	7145-0026	"SOIL"	708788	0.105	105	PASS
19	7145-0027	WATER	660381	0.098	98.2	PASS
20	7145-0028	WATER	674452	0.100	100	PASS
21	7145-0028R	WATER	698240	0.103	103	PASS
22	SPK 7/30/93	WATER	667988	0.099	99.2	PASS
23	SPKDUP 7/30/93	WATER	673737	0.100	100	PASS
24	SPK 8/2/93	WATER	516988	0.078	78.1 <sup>A</sup>	*FAIL*
25	SPKDUP 8/2/93	WATER	612974	0.092	91.6	PASS

\* - See C.A.F. 092. 8-3-93

QC Limits (Water) = 89-162%  
 QC Limits (Soil) = 56-144%

Reviewed By/Date: CAK 8-3-93  
 Approved By/Date: RL 08-03-93

# WISCONSINGRO SURROGATE RECOVERY FORM

Batch # : 24422  
 Dates of Analysis: 7/30-8/2/93  
 Instrument ID : 5890  
 Calc. by/ Date: A.J.K./8-3-93

	Sample Number	Matrix	Total Surrogate Response (Area)	Conc. (mg/L)	Percent Recovery (%)	PASS/*FAIL*
1)	BLANK 8/2/93	WATER	665593	0.099	98.9	PASS
2)	SLSPK 7/30/93	"SOIL"	651044	0.097	96.9	PASS
3)	SLSPKDUP 7/30/93	"SOIL"	706758	0.105	105	PASS
4)	SLSPK 8/1/93	"SOIL"	715787	0.106	106	PASS
5)	SLSPKDUP 8/1/93	"SOIL"	790369	0.116	116	PASS
6)						
7)						
8)						
9)						
10)						
11)						
12)						
13)						
14)						
15)						
16)						
17)						
18)						
19)						
20)						
21)						
22)						
23)						
24)						
25)						

QC Limits (Water) = 89-162%  
 QC Limits (Soil) = 56-144%

Reviewed By/Date: CAK 8-3-93  
 Approved By/Date: Paul 08-03-93

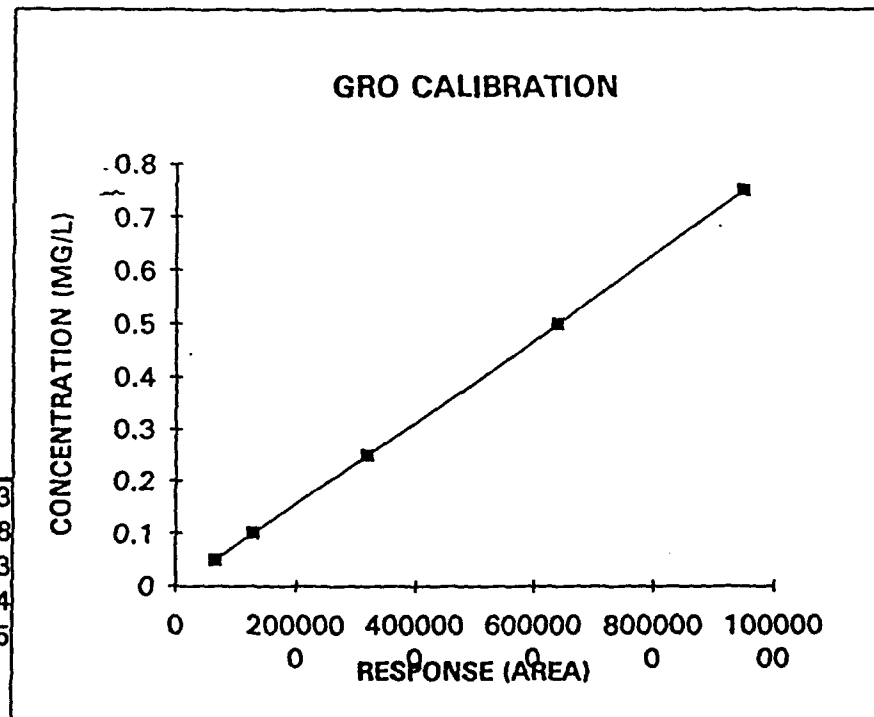
## WISCONSIN GRO INITIAL CALIBRATION

Date: 7/27/93Standard Lot#: MC 1231 INSTRUMENT ID: HP5890Reference to  
Batch # 24422  
AQ 9/1 8-3-93

Total Response (Area;X)	Total GRO Concentration (mg/L;Y)	Actual Conc. from curve
654961	0.05	0.050175
1265878	0.1	0.098328
3190382	0.25	0.250018
6411587	0.5	0.503915
9502759	0.75	0.747563
12834955	1	1.010208

Y-Intercept : 0.0003826  
 Slope: 7.81944E-08  
 R squared: 0.99990939

Calibration	Array
7.82E-08	0.000383
3.72E-10	0.002668
0.999909	0.00403
44141.39	4
0.717018	6.5E-05



Calculated By/Date : AJX 7-28-93  
 Reviewed By/Date : CAK 8-3-93  
 Approved By/Date : PMU 08-03-93



## WISCONSIN GRO SURROGATE CALIBRATION

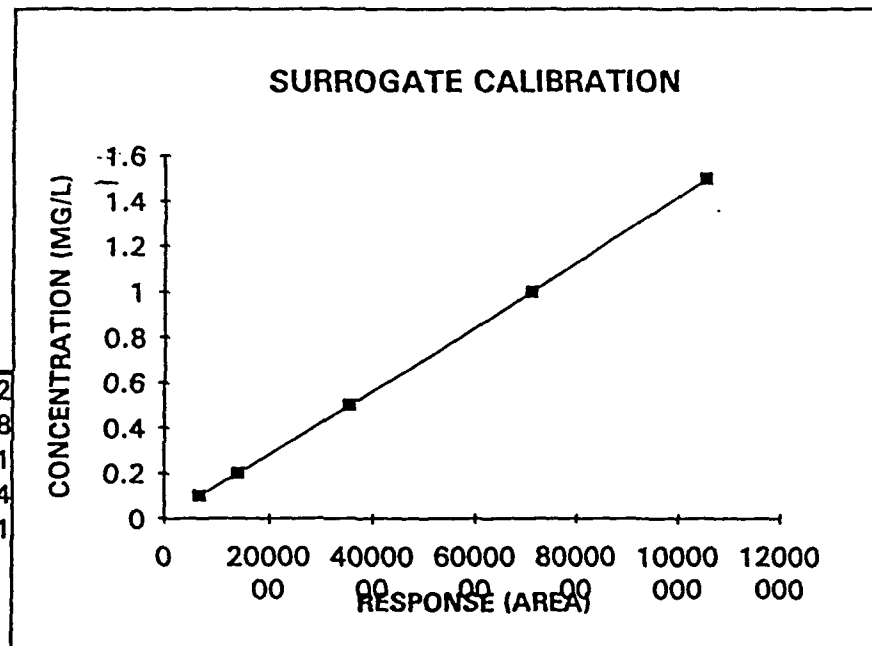
Date: 7/27/93

INSTRUMENT ID: HP5890

Total Response (Area;X)	Total Surrogate Concentration (mg/L;Y)
675619	0.1
1411206	0.2
3552334	0.5
7114013	1
10560577	1.5
14359925	2

Y-Intercept : 0.005901514  
 Slope: 1.39742E-07  
 R squared: 0.999822216

Calibration	Array
1.4E-07	0.005902
9.32E-10	0.007448
0.999822	0.011291
22495.16	4
2.867823	0.00051



Calculated By/Date : A.J.K. / 7-28-93  
 Reviewed By/Date : CAK / 8-3-93  
 Approved By/Date : AME 08-03-93

## PVOC SURROGATE RECOVERY FORM

Batch#: 24423

8630 & HP5890

Date(s) of Run: 7-30-93 / 8-2-93

Calc. by/date: Q.O.K. / 8-3-93

[illegible]

Comments: \_\_\_\_\_

\* Outside of QC Limits 0 of 15 outside of QC Limits

Reviewed by: CHK  
Date: 8-3-93

Version: 860/V2.2  
File: GUMMO

Printed: 21-Jun-1993 at 10:55:51  
GC Project: PVOC8630

Page 1  
User: WVWAYDICK

GC Calibration Method MEPVOC

Channel 1

*Calibrated 6-18-93-JCW*  
*Raw Data in BH 23523*

Channel Parameters:

Calibrate Channel ? YES  
Retention Time Offset 0.00 sec  
Relative Peak Window 7%  
Absolute Peak Window 20 sec  
Update Retention Time ? NO

Peak Table:

Peak Name	Ret Time	Fit. Type	Levels	By	R I D	Group
MTBE	2.37	Linear	6	Height		1

Peak Name	Coefficients
MTBE	A = -1.478193e+03 B = 1.531117e+03 R <sup>2</sup> = 0.998327

Level Table:

Peak Name: MTBE

Retention Time: 2.37 min

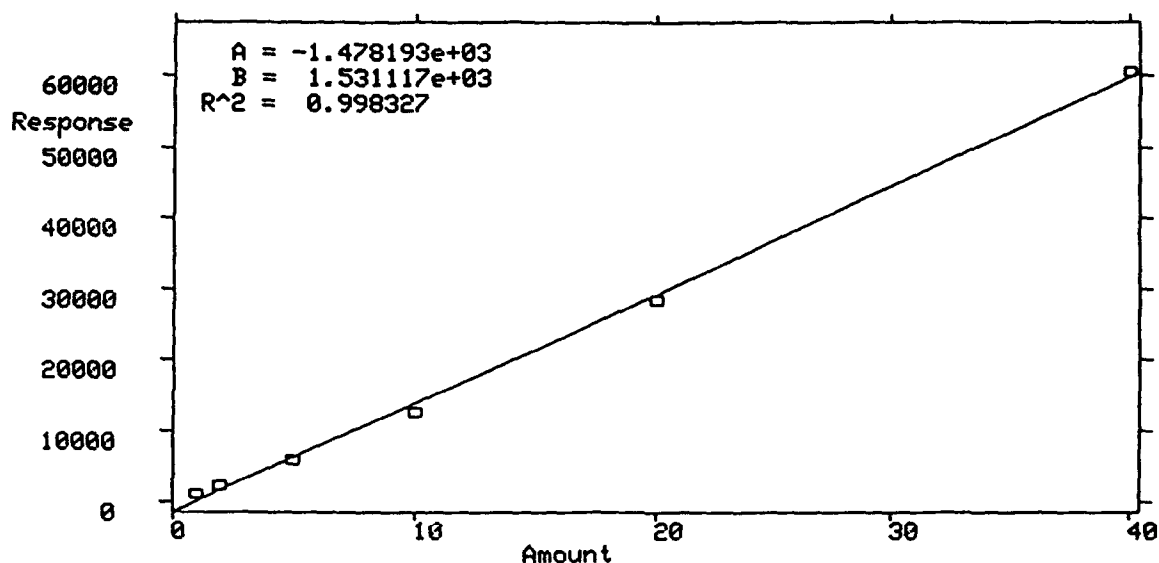
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	1098.000000*	2	0.00	YES
2	2.000000	2244.000000*	2	0.00	YES
3	5.000000	5845.000000*	2	0.00	YES
4	10.000000	12549.000000*	2	0.00	YES
5	20.000000	28360.000000*	2	0.00	YES
6	40.000000	60462.000000*	2	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration - Method MEPVOC...Peak MTBE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
BENZENE	4.00	Linear	6	Height		1

Peak Name Coefficients  
 BENZENE  $A = -5.804069e+03$   
 $B = 6.263467e+03$   
 $R^2 = 0.999347$

## Level Table:

Peak Name: BENZENE Retention Time: 4.00 min

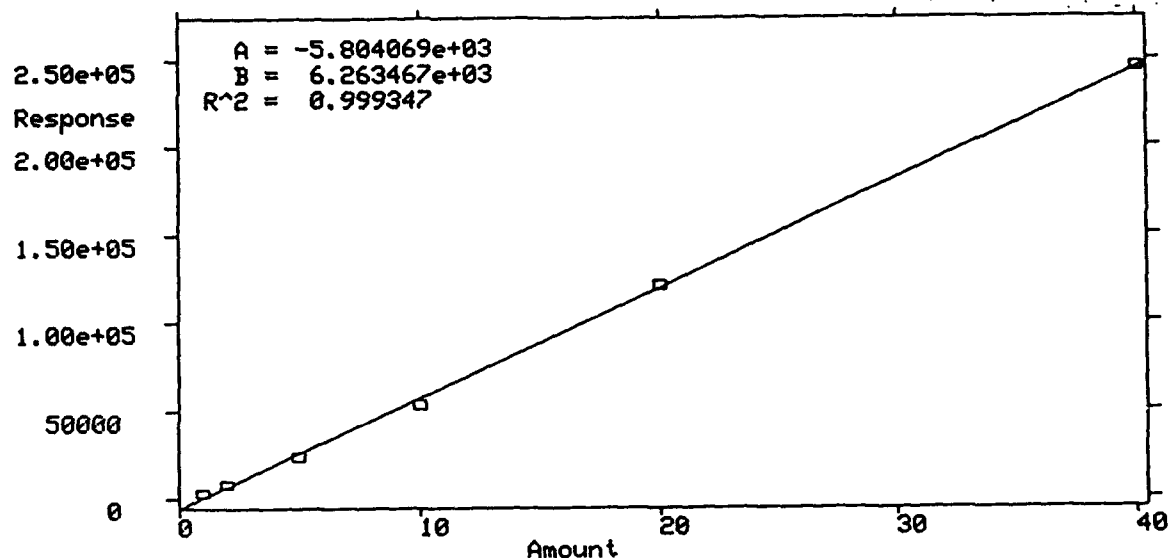
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2845.000000*	2	0.00	YES
2	2.000000	8016.000000*	2	0.00	YES
3	5.000000	23922.000000*	2	0.00	YES
4	10.000000	52844.000000*	2	0.00	YES
5	20.000000	121121.000000*	2	0.00	YES
6	40.000000	244978.000000*	2	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method MEVOC Peak BENZENE Channel 1



Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R	I	D	Group
AAATFT	5.18	Linear	6	Height	X			1

Peak Name Coefficients  
 AAATFT A = -8.281294e+02  
 B = 1.484070e+03  
 $R^2 = 0.994351$

Level Table:

Peak Name: AAATFT Retention Time: 5.18 min

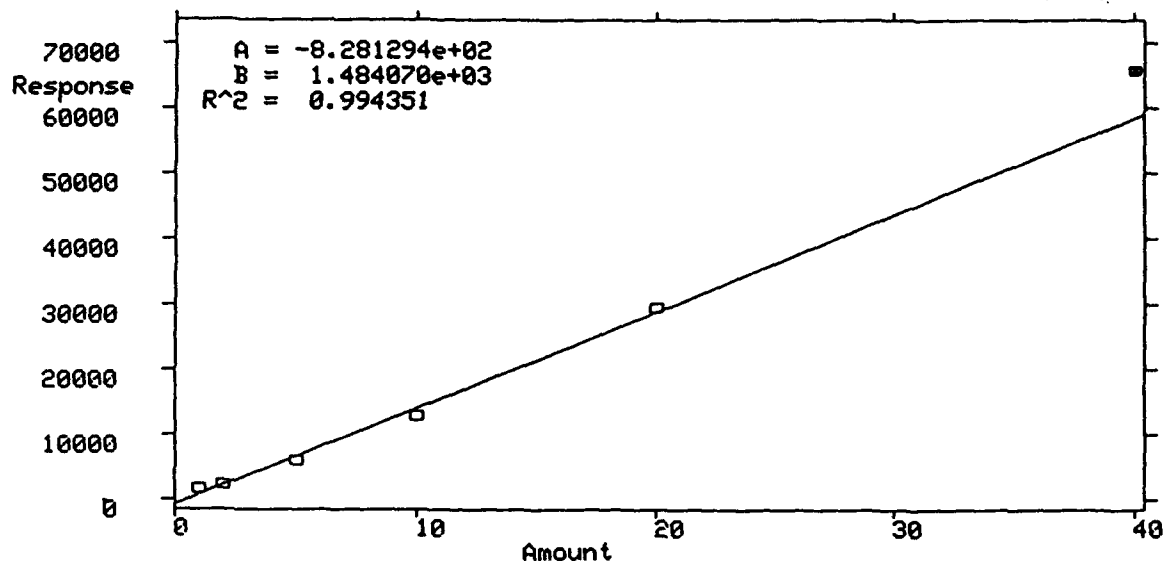
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	1623.000000*	2	0.00	YES
2	2.000000	2260.000000*	2	0.00	YES
3	5.000000	5969.000000*	2	0.00	YES
4	10.000000	12894.000000*	2	0.00	YES
5	20.000000	29508.000000*	2	0.00	YES
6	40.000000	65811.000000*	2	0.00	NO

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method MEPVOC Peak AATFT Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
TOLUENE	6.66	Linear	6	Height		1

Peak Name Coefficients  
 TOLUENE  $A = -3.113760e+03$   
 $B = 4.922341e+03$   
 $R^2 = 0.998562$

## Level Table:

Peak Name: TOLUENE Retention Time: 6.66 min

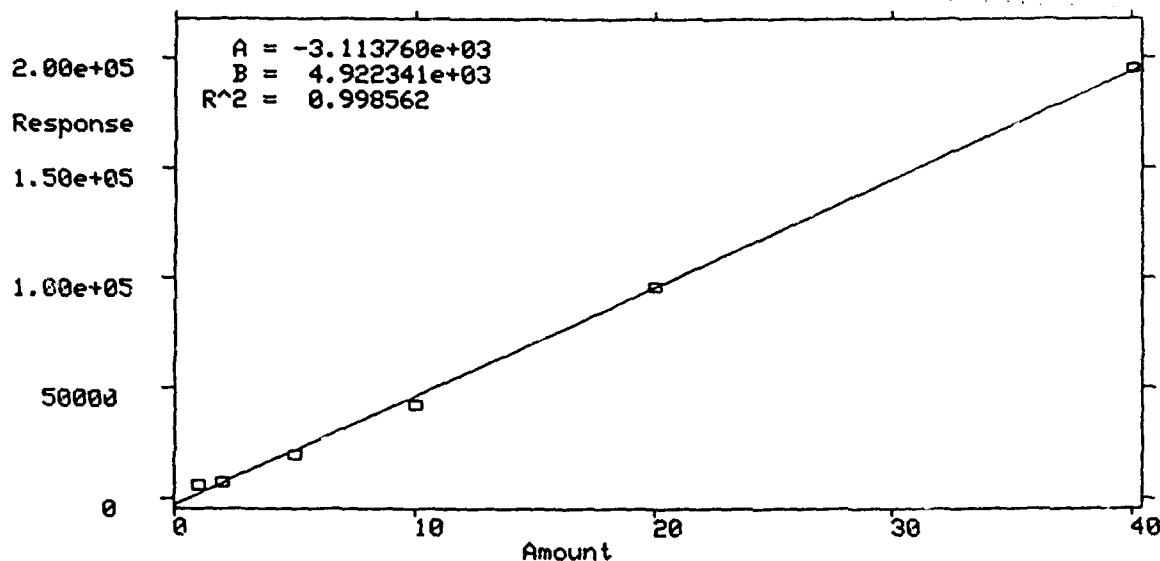
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	6029.000000*	2	0.00	YES
2	2.000000	7299.000000*	2	0.00	YES
3	5.000000	19443.000000*	2	0.00	YES
4	10.000000	42169.000000*	2	0.00	YES
5	20.000000	95531.000000*	2	0.00	YES
6	40.000000	194789.000000*	2	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method MEVOC Peak TOLUENE Channel 1



Channel Parameters:

Calibrate Channel ? YES  
Retention Time Offset 0.00 sec  
Relative Peak Window 7%  
Absolute Peak Window 20 sec  
Update Retention Time ? NO

Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
ETHYL BENZENE	9.54	Linear	6	Height		1

Peak Name Coefficients

ETHYL BENZENE A = -2.899081e+03  
B = 4.393301e+03  
R<sup>2</sup> = 0.999582

Level Table:

Peak Name: ETHYL BENZENE Retention Time: 9.54 min

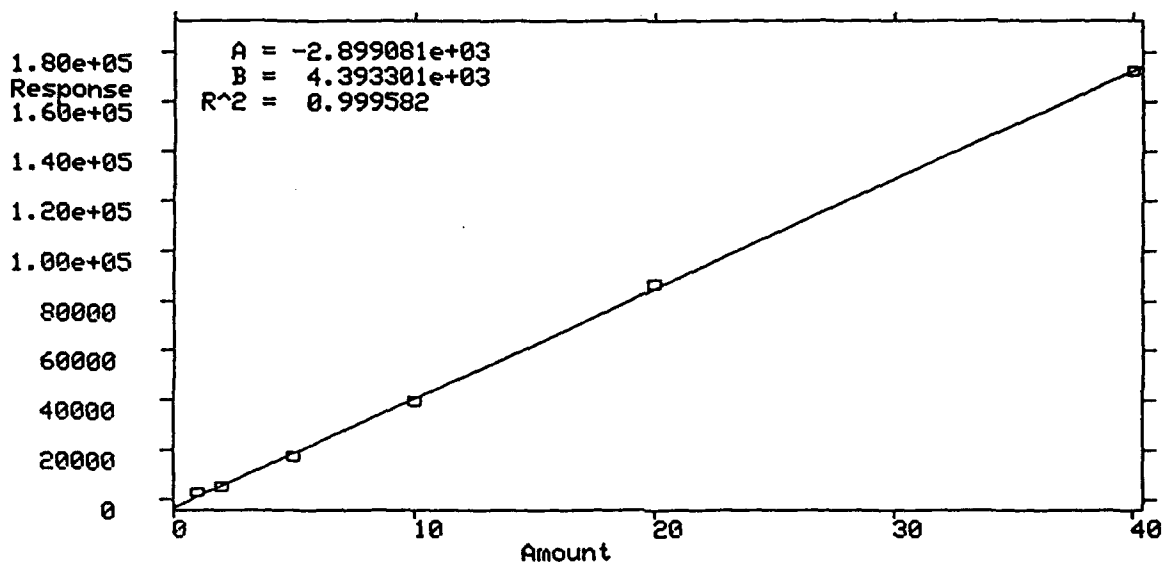
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	3136.000000*	2	0.00	YES
2	2.000000	5566.000000*	2	0.00	YES
3	5.000000	17795.000000*	2	0.00	YES
4	10.000000	39698.000000*	2	0.00	YES
5	20.000000	86607.000000*	2	0.00	YES
6	40.000000	172481.000000*	2	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method: MEPVOC, Peak: ETHYL BENZENE, Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
M&P XYLENE	9.80	Linear	6	Height		1

Peak Name Coefficients  
 M&P XYLENE  $A = -2.542224e+03$   
 $B = 4.763400e+03$   
 $R^2 = 0.999653$

## Level Table:

Peak Name: M&P XYLENE Retention Time: 9.80 min

Level	Amount	Response	Reps	% RSD	Calibrate?
1	2.000000	8149.000000*	2	0.00	YES
2	4.000000	14355.000000*	2	0.00	YES
3	10.000000	43998.000000*	2	0.00	YES
4	20.000000	91998.000000*	2	0.00	YES
5	40.000000	192826.000000*	2	0.00	YES
6	80.000000	376511.000000*	2	0.00	YES

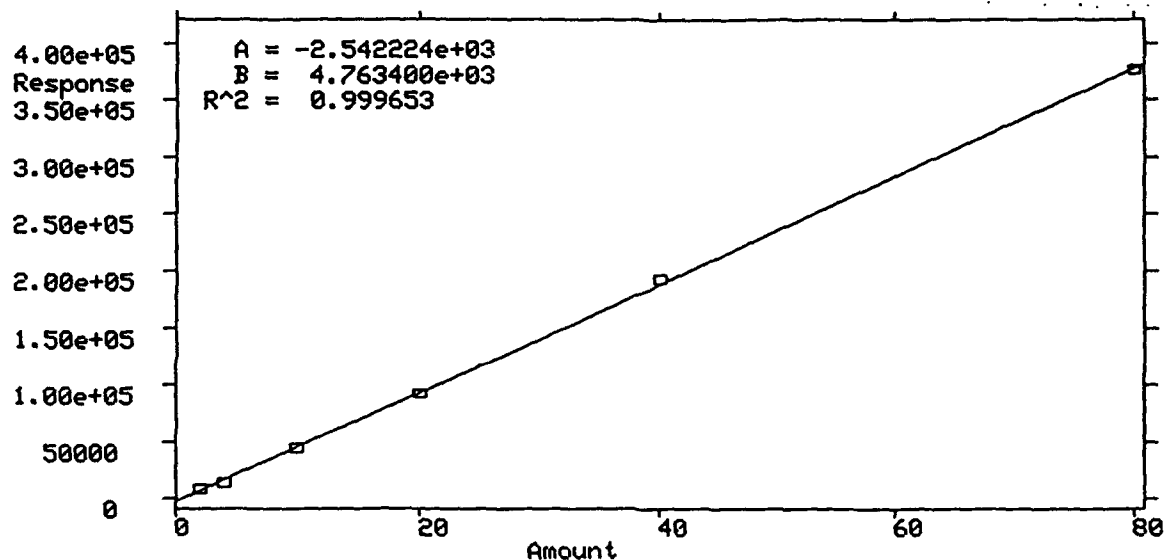
\* A manual response was entered for this level.



Channel 1 (continued)

Curves:

LC Calibration Method MEPVOC Peak M&amp;P XYLENE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
Retention Time Offset 0.00 sec  
Relative Peak Window 7%  
Absolute Peak Window 20 sec  
Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
O XYLENE	10.64	Linear	6	Height		1

Peak Name Coefficients

O XYLENE A = -3.612778e+03  
B = 4.129611e+03  
R^2 = 0.998936

## Level Table:

Peak Name: O XYLENE Retention Time: 10.64 min

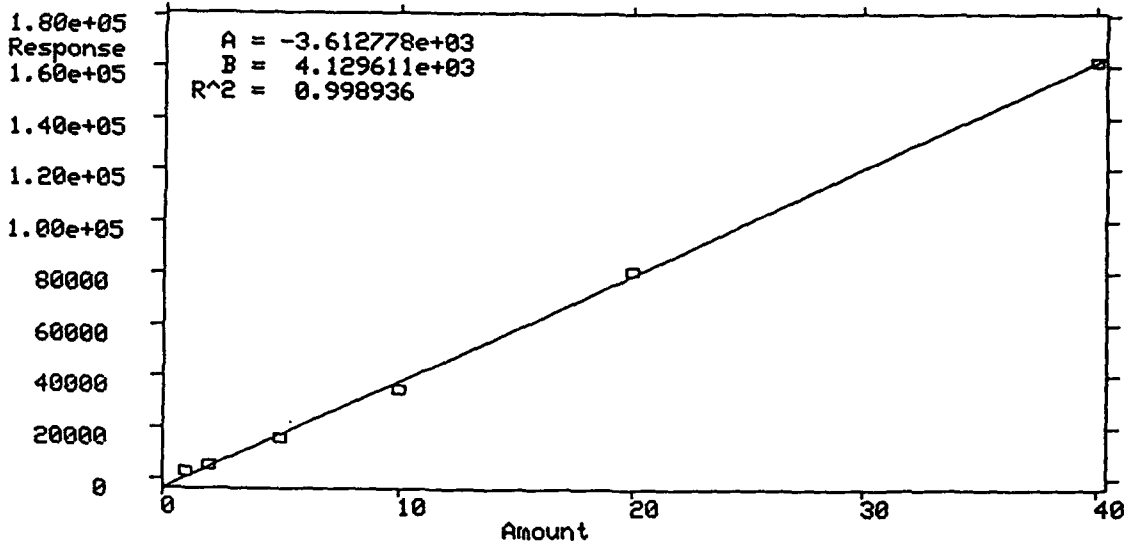
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2782.000000*	2	0.00	YES
2	2.000000	5214.000000*	2	0.00	YES
3	5.000000	15595.000000*	2	0.00	YES
4	10.000000	34555.000000*	2	0.00	YES
5	20.000000	80697.000000*	2	0.00	YES
6	40.000000	161590.000000*	2	0.00	YES

\* A manual response was entered for this level.

## Channel 1 (continued)

## Curves:

LC Calibration Method MEPVOC Peak 0 XYLENE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
Retention Time Offset 0.00 sec  
Relative Peak Window 7%  
Absolute Peak Window 20 sec  
Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
135-TMB	12.96	Linear	6	Height		1

Peak Name	Coefficients
135-TMB	A = -3.789100e+03 B = 5.017982e+03 R <sup>2</sup> = 0.999391

## Level Table:

Peak Name: 135-TMB

Retention Time: 12.96 min

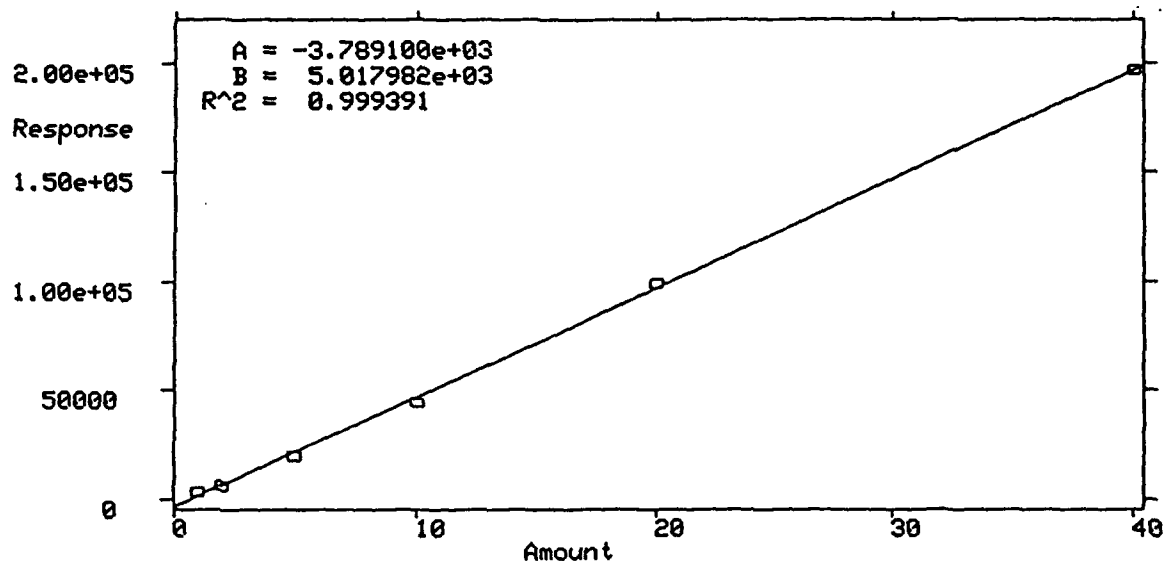
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	3345.000000*	2	0.00	YES
2	2.000000	6221.000000*	2	0.00	YES
3	5.000000	19781.000000*	2	0.00	YES
4	10.000000	44018.000000*	2	0.00	YES
5	20.000000	98712.000000*	2	0.00	YES
6	40.000000	196591.000000*	2	0.00	YES

\* A manual response was entered for this level.

## Channel 1 (continued)

## Curves:

LC Calibration Method MEVOC Peak 135-TMB Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
Retention Time Offset 0.00 sec  
Relative Peak Window 7%  
Absolute Peak Window 20 sec  
Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
124-TMB	13.84	Linear	6	Height		1

Peak Name Coefficients  
124-TMB A = -3.039434e+03  
B = 3.550315e+03  
R^2 = 0.998279

## Level Table:

Peak Name: 124-TMB Retention Time: 13.84 min

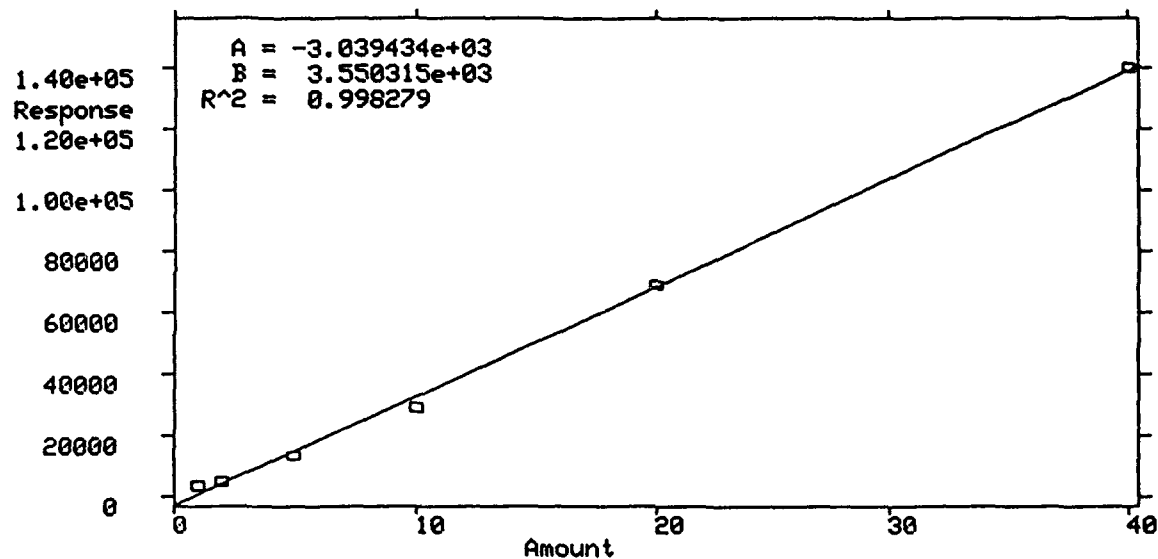
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	3440.000000*	2	0.00	YES
2	2.000000	4703.000000*	2	0.00	YES
3	5.000000	13352.000000*	2	0.00	YES
4	10.000000	28927.000000*	2	0.00	YES
5	20.000000	68721.000000*	2	0.00	YES
6	40.000000	139545.000000*	2	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method MEPVOC. Peak 124-TMB Channel 1



Version: 860/V2.2

Printed: 28-Jul-1993 at 15:37:52

Page 1

Node: GUMMO

GC Project: HP5890

User: WVKOTLAREK

Waters GC Calibration Method WIGVOC

Channel 1

*Reference  
To Batch #  
24423  
AQH  
8-3-93*

Channel Parameters:

Calibrate Channel ? YES  
Retention Time Offset 0.00 sec  
Relative Peak Window 7%  
Absolute Peak Window 20 sec  
Update Retention Time ? NO

Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
MTBE	6.35	Linear	7	Height		1

Peak Name	Coefficients
MTBE	A = -3.264756e+02 B = 3.892445e+02 R^2 = 0.998850

Level Table:

Peak Name: MTBE

Retention Time: 6.35 min

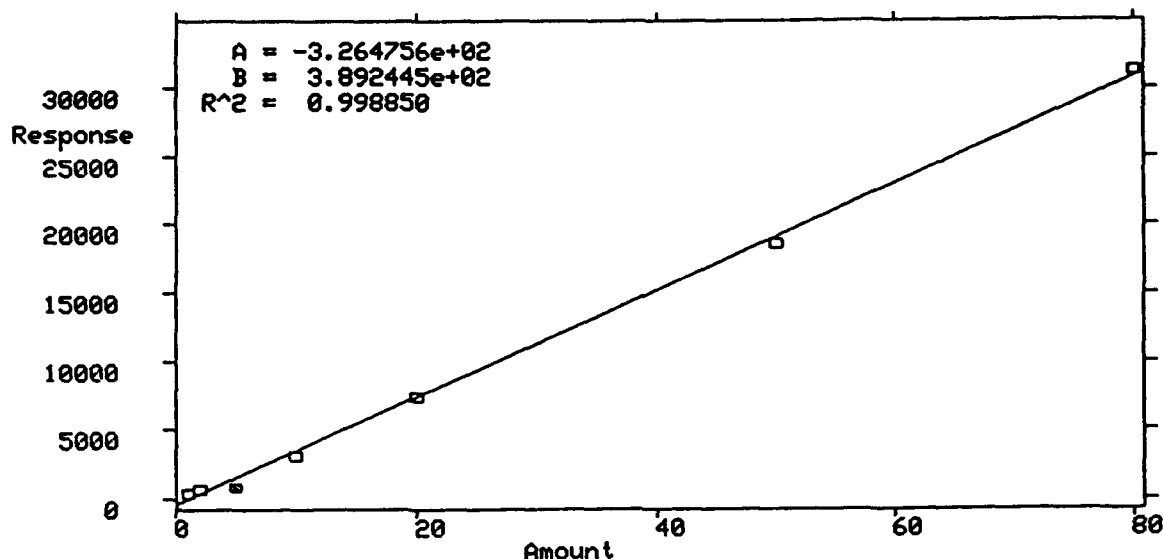
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	447.000000*	1	0.00	YES
2	2.000000	711.000000*	1	0.00	YES
3	5.000000	842.000000*	1	0.00	NO
4	10.000000	3129.000000*	1	0.00	YES
5	20.000000	7399.000000*	1	0.00	YES
6	50.000000	18589.000000*	1	0.00	YES
7	80.000000	31213.000000*	1	0.00	YES

\* A manual response was entered for this level.

## Channel 1 (continued)

## Curves:

LC Calibration Method WIGVOC Peak MTBE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
BENZENE	11.87	Linear	7	Height		1

Peak Name	Coefficients
BENZENE	$A = -1.805573e+03$ $B = 1.965003e+03$ $R^2 = 0.999048$

## Level Table:

Peak Name: BENZENE Retention Time: 11.87 min

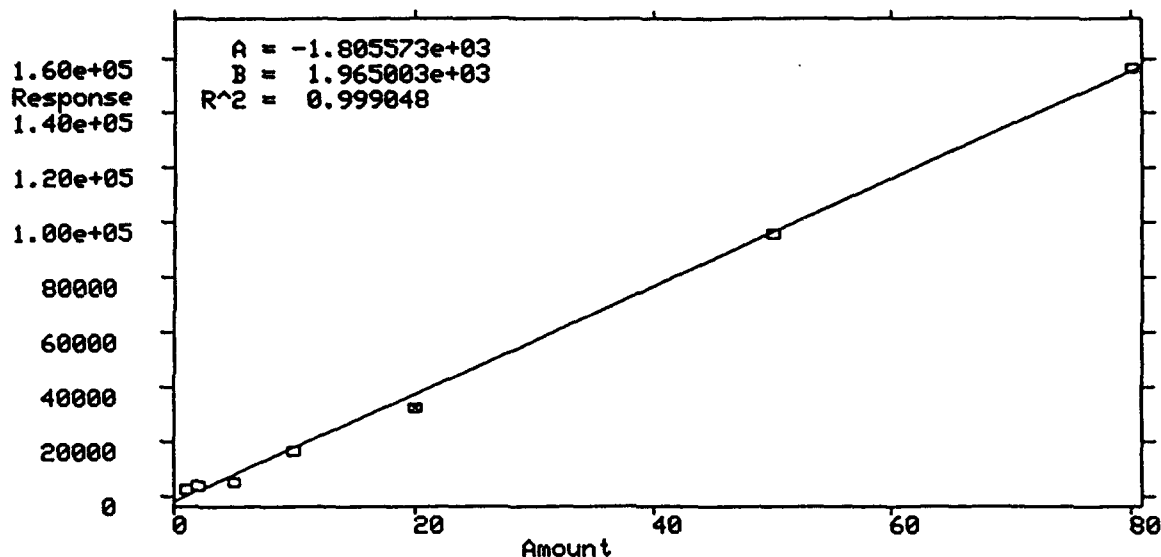
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2533.000000*	1	0.00	YES
2	2.000000	3917.000000*	1	0.00	YES
3	5.000000	5167.000000*	1	0.00	YES
4	10.000000	16553.000000*	1	0.00	YES
5	20.000000	32350.000000*	1	0.00	NO
6	50.000000	95678.000000*	1	0.00	YES
7	80.000000	156139.000000*	1	0.00	YES

\* A manual response was entered for this level.

## Channel 1 (continued)

## Curves:

LC Calibration Method WIGVOC Peak BENZENE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	E	R	I	D	Group
AAATFT	13.94	Linear	7	Height	X			1

Peak Name Coefficients  
 AAATFT A = 1.298172e+02  
 B = 7.597755e+02  
 R<sup>2</sup> = 0.997345

## Level Table:

Peak Name: AAATFT

Retention Time: 13.94 min

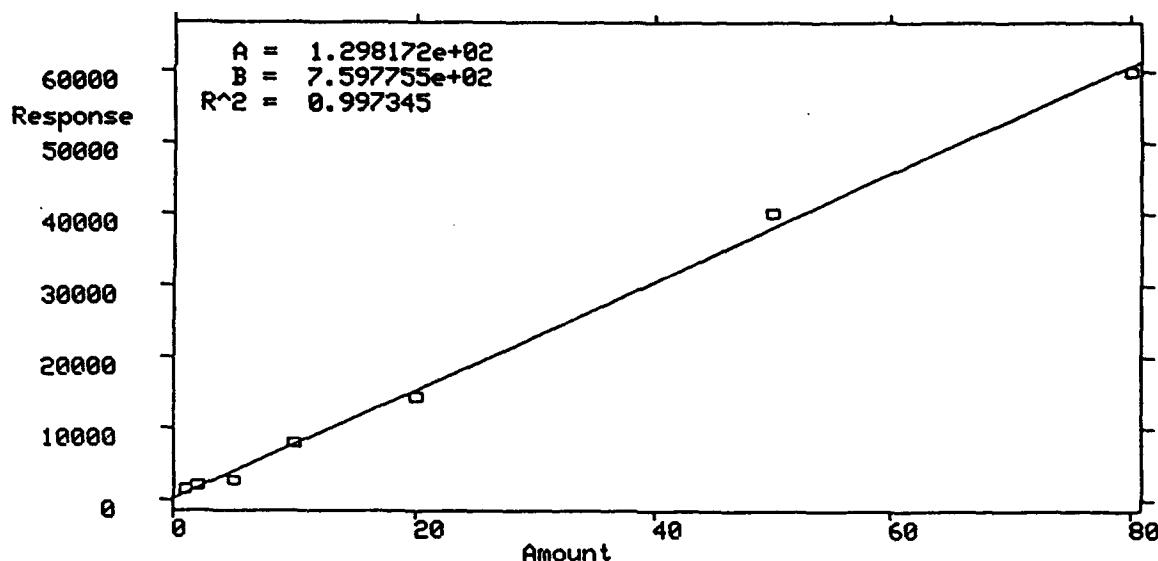
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	1515.000000*	1	0.00	YES
2	2.000000	1996.000000*	1	0.00	YES
3	5.000000	2669.000000*	1	0.00	YES
4	10.000000	7936.000000*	1	0.00	YES
5	20.000000	14357.000000*	1	0.00	YES
6	50.000000	40170.000000*	1	0.00	YES
7	80.000000	59908.000000*	1	0.00	YES

\* A manual response was entered for this level.

## Channel 1 (continued)

## Curves:

LC Calibration Method WIGVOC Peak AATFT Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
TOLUENE	17.58	Linear	7	Height		1

Peak Name	Coefficients
TOLUENE	$A = -2.083429e+02$ $B = 1.566145e+03$ $R^2 = 0.998928$

## Level Table:

Peak Name: TOLUENE Retention Time: 17.58 min

Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2583.000000*	1	0.00	YES
2	2.000000	4180.000000*	1	0.00	YES
3	5.000000	5433.000000*	1	0.00	YES
4	10.000000	16577.000000*	1	0.00	YES
5	20.000000	30098.000000*	1	0.00	YES
6	50.000000	76491.000000*	1	0.00	YES
7	80.000000	126292.000000*	1	0.00	YES

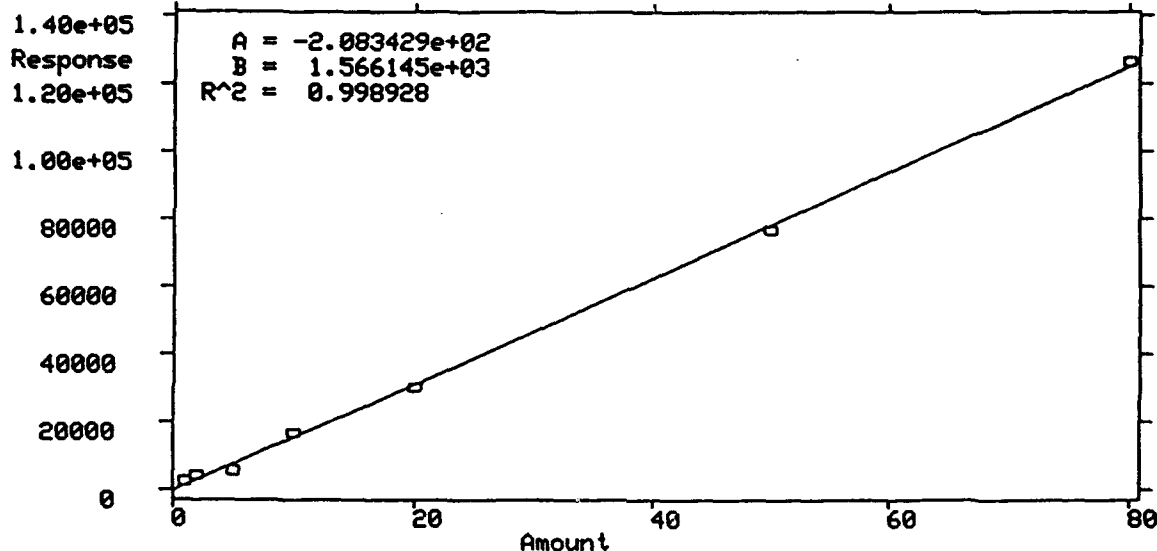
\* A manual response was entered for this level.



## Channel 1 (continued)

## Curves:

LC Calibration Method WIGVOC Peak TOLUENE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
Retention Time Offset 0.00 sec  
Relative Peak Window 7%  
Absolute Peak Window 20 sec  
Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
ETHYL-BENZENE	22.12	Linear	7	Height		1

Peak Name	Coefficients
ETHYL-BENZENE	A = -1.387148e+03 B = 2.080488e+03 R <sup>2</sup> = 0.998658

## Level Table:

Peak Name: ETHYL-BENZENE Retention Time: 22.12 min

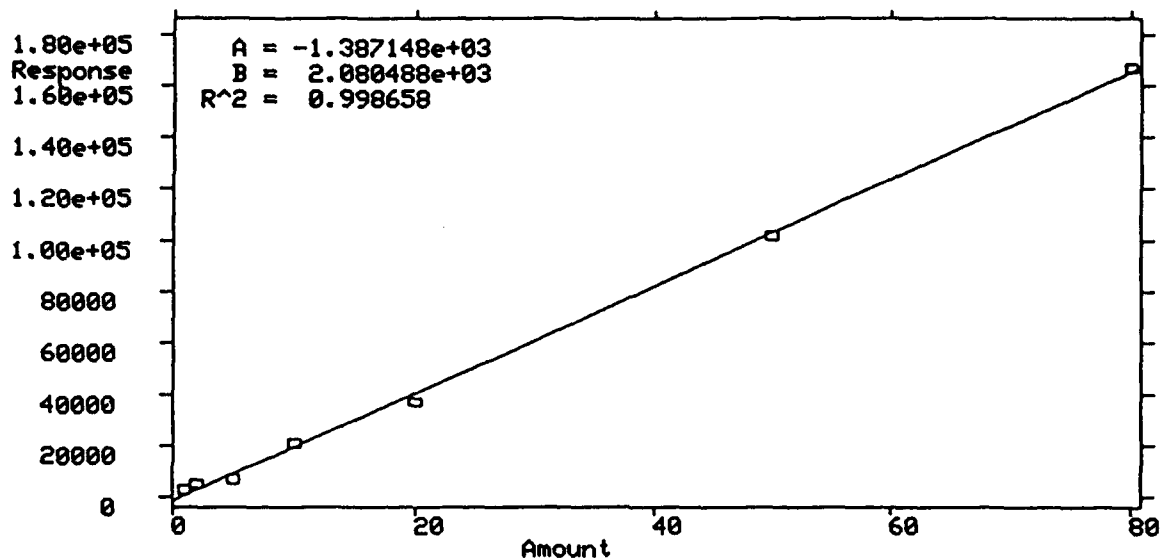
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2809.000000*	1	0.00	YES
2	2.000000	4950.000000*	1	0.00	YES
3	5.000000	6703.000000*	1	0.00	YES
4	10.000000	20544.000000*	1	0.00	YES
5	20.000000	36684.000000*	1	0.00	YES
6	50.000000	101638.000000*	1	0.00	YES
7	80.000000	166484.000000*	1	0.00	YES

\* A manual response was entered for this level.

## Channel 1 (continued)

## Curves:

LC Calibration Method WIGVOC Peak ETHYL-BENZENE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R	I	D	Group
M&P-XYLENE	22.33	Linear	7	Height				1

Peak Name	Coefficients
M&P-XYLENE	$A = -4.113142e+03$ $B = 2.409013e+03$ $R^2 = 0.999207$

## Level Table:

Peak Name: M&P-XYLENE Retention Time: 22.33 min

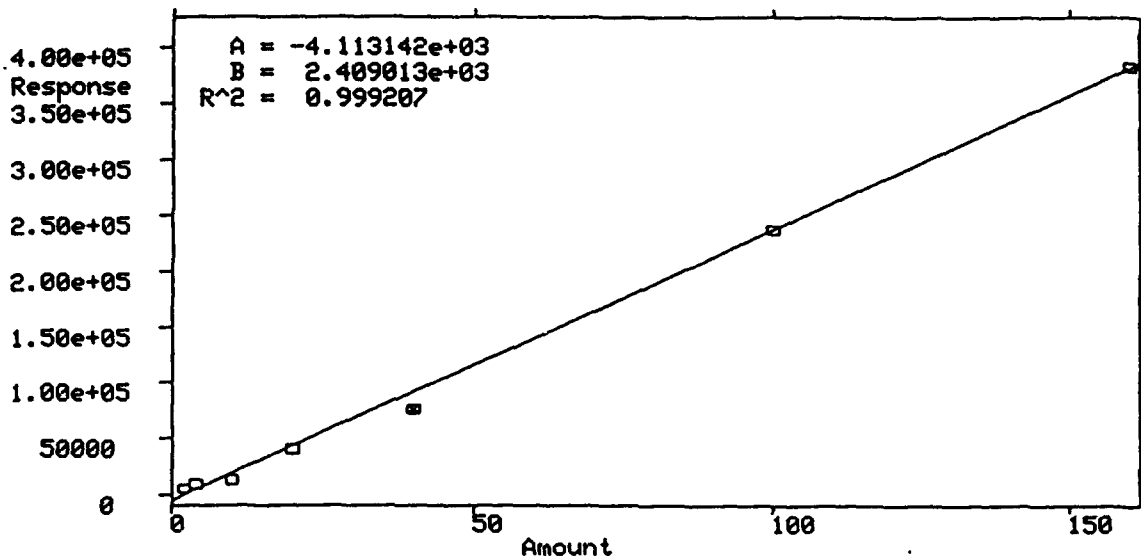
Level	Amount	Response	Reps	% RSD	Calibrate?
1	2.000000	5660.000000*	1	0.00	YES
2	4.000000	9960.000000*	1	0.00	YES
3	10.000000	13472.000000*	1	0.00	YES
4	20.000000	40656.000000*	1	0.00	YES
5	40.000000	76153.000000*	1	0.00	NO
6	100.000000	236425.000000*	1	0.00	YES
7	160.000000	382216.000000*	1	0.00	YES

\* A manual response was entered for this level.

## Channel 1 (continued)

## Curves:

LC Calibration Method WIGVOC Peak M&amp;P-XYLENE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
O-XYLENE	23.43	Linear	7	Height		1

Peak Name Coefficients  
 O-XYLENE  $A = -4.502373e+02$   
 $B = 1.947266e+03$   
 $R^2 = 0.999027$

## Level Table:

Peak Name: O-XYLENE Retention Time: 23.43 min

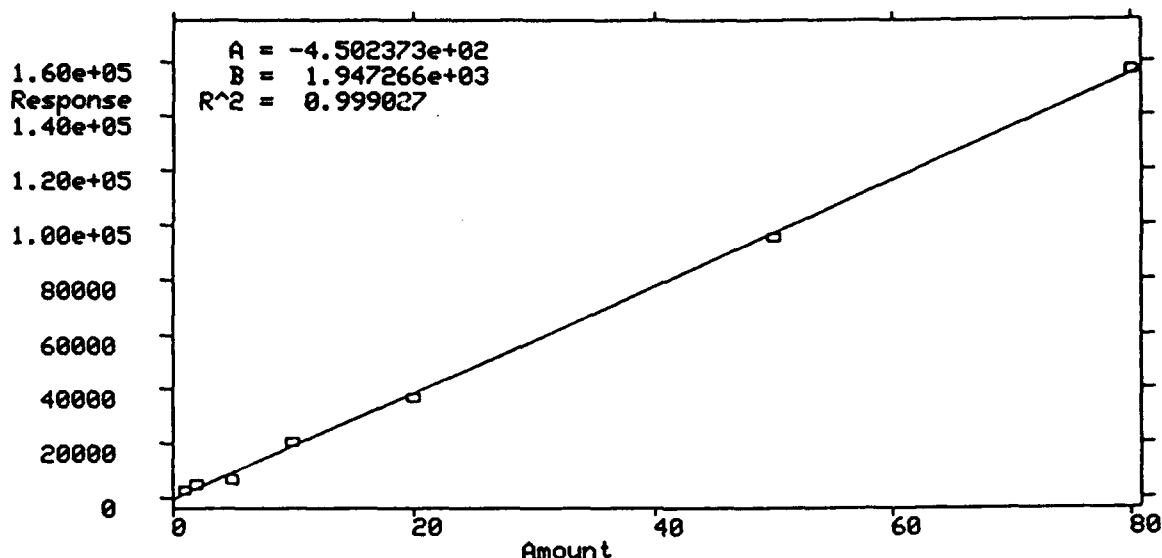
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2806.000000*	1	0.00	YES
2	2.000000	4993.000000*	1	0.00	YES
3	5.000000	6699.000000*	1	0.00	YES
4	10.000000	20589.000000*	1	0.00	YES
5	20.000000	36980.000000*	1	0.00	YES
6	50.000000	95282.000000*	1	0.00	YES
7	80.000000	156640.000000*	1	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method WIGVOC Peak O-XYLENE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R	I	D	Group
135-TMB	25.68	Linear	7	Height				1

Peak Name Coefficients  
 135-TMB  $A = -3.469401e+02$   
 $B = 2.690837e+03$   
 $R^2 = 0.999154$

## Level Table:

Peak Name: 135-TMB Retention Time: 25.68 min

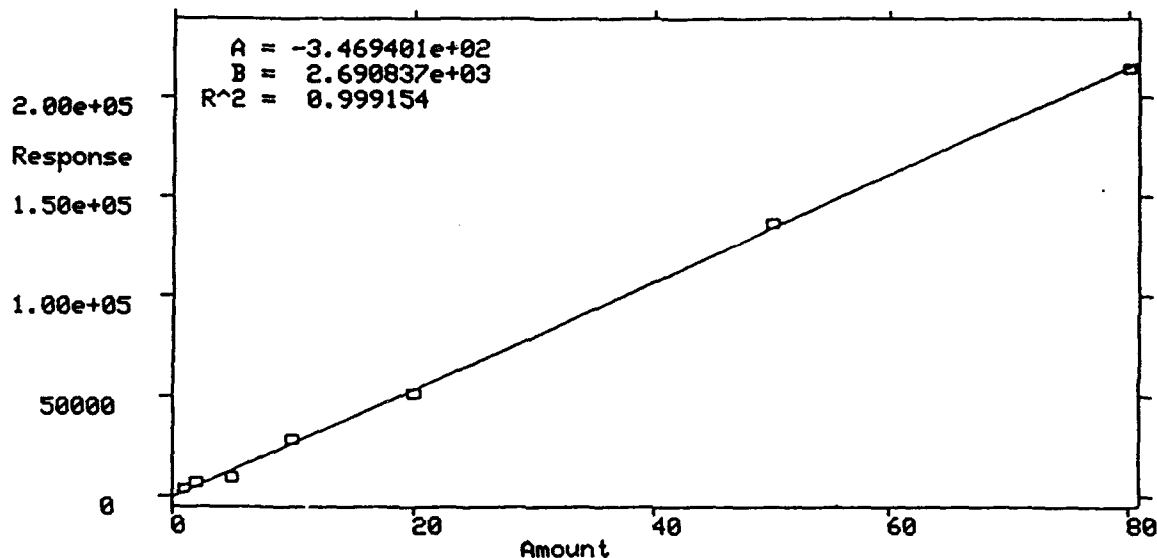
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	3748.000000*	1	0.00	YES
2	2.000000	6731.000000*	1	0.00	YES
3	5.000000	9151.000000*	1	0.00	YES
4	10.000000	28206.000000*	1	0.00	YES
5	20.000000	51357.000000*	1	0.00	YES
6	50.000000	136366.000000*	1	0.00	YES
7	80.000000	214073.000000*	1	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method WIGVOC Peak 135-TMB Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
124-TMB	26.55	Linear	7	Height		1

Peak Name	Coefficients
124-TMB	$A = 1.921735e+02$ $B = 2.082630e+03$ $R^2 = 0.999065$

## Level Table:

Peak Name: 124-TMB

Retention Time: 26.55 min

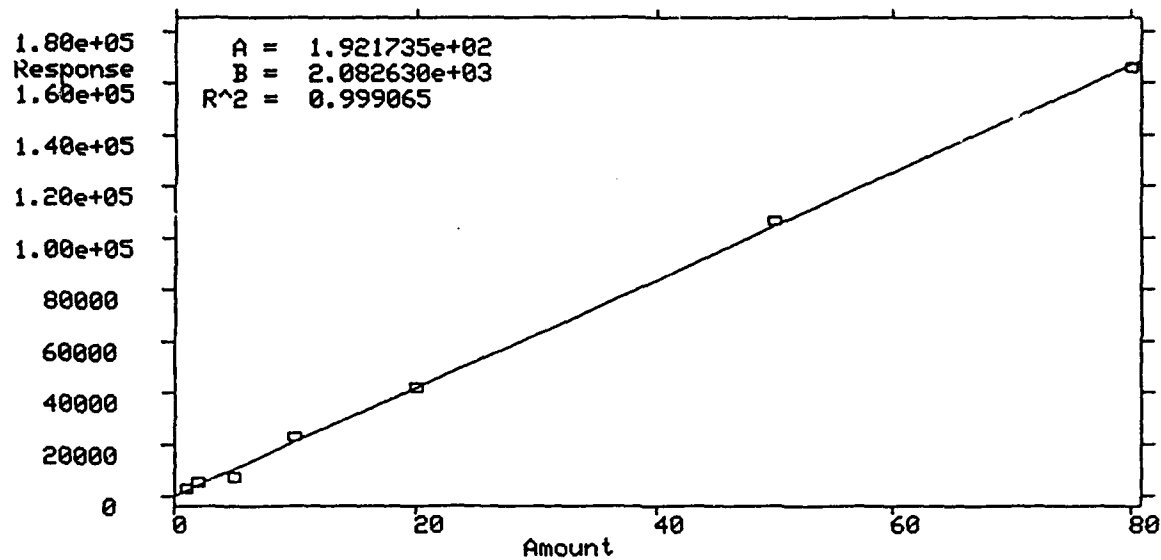
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2689.000000*	1	0.00	YES
2	2.000000	5162.000000*	1	0.00	YES
3	5.000000	7004.000000*	1	0.00	YES
4	10.000000	22782.000000*	1	0.00	YES
5	20.000000	41749.000000*	1	0.00	YES
6	50.000000	106221.000000*	1	0.00	YES
7	80.000000	165620.000000*	1	0.00	YES

\* A manual response was entered for this level.

## Channel 1 (continued)

## Curves:

LC Calibration Method WIGVOC Peak 124-TMB Channel 1



Sample Information:

Date Sampled: 7-28-93

Date of Analysis: 7-30-93

Holding Time Exceeded? (7 days) Y (N)

Matrix: Water (Soil) Other \_\_\_\_\_ (circle one)

Sample Handling: refrigerated? (Y) N  
preservation type? NONE

Instrument Information:

Analytical Balance ID: Cahn Sartorius (circle one)

Top Loading Balance ID: Sartorius AND (circle one)

Oven: (FISHER) ISOTEMP (NOTE OTHER)

DISH #	LAB #	SAMPLE DESCRIPTION	SAMPLE ML OR (GM*)	(B) WEIGHT DISH GM	(A) DISH + RESIDUE GM	RESULT RESIDUE % OR MG/L
P1	BLANK	BLANK	—	1.57	1.57	<0.5
P2	7145-0012		10.32	1.59	10.30	84.4
P3	7145-0013		10.94	1.60	11.39	89.5
P4	7145-0014		10.25	1.57	10.66	88.7
P5	7145-0015		10.81	1.58	11.02	87.3
P6	7145-0016		10.45	1.56	10.94	89.8
P7	7145-0017		10.28	1.61	10.83	89.7
P8	7145-0017 <sup>Ⓢ</sup>		10.07	1.59	10.59	89.4
P9	7145-0018		10.18	1.59	10.43	86.8
P10	7145-0019		11.28	1.60	11.05	83.8
P11	7145-0020		10.47	1.61	10.30	83.0
P12	7145-0021		10.24	1.59	11.13	93.2

RPD =  $\frac{89.7 - 89.4}{39.6} \times 100 = 0.3\%$

CALCULATIONS:  $MG/L \text{ RESIDUE} = \frac{(A-B) \times 1000000}{C}$

% TOTAL SOLIDS =  $\frac{(A-B) \times 100}{C}$

\*Weigh solids and report in %; take volume of aqueous samples and report in mg/L.  
Note which units results are reported in.

NOTE ANY COMMENTS ON BACK OF SHEET!!!

Reviewed by: gmb

Date: 8-3-93

QC REVIEW BY: gmb

DATE: 8-3-93



Sample Information:

Date Sampled: 7-28-93  
Date of Analysis: 7-30-93  
Holding Time Exceeded? (7 days) Y ☒  
Matrix: Water ☒ Soil ☐ Other \_\_\_\_\_ (circle one)

Sample Handling: refrigerated? ☒ N  
preservation type? NONE

Instrument Information:

Analytical Balance ID: Cahn Sartorius (circle one)  
Top Loading Balance ID: Sartorius AND (circle one)  
Oven: FISHER ISOTEMP (NOTE OTHER)

DISH #	LAB #	SAMPLE DESCRIPTION	SAMPLE ML OR (GM*)	WIGHT DISH GM	(A) DISH + RESIDUE GM	RESULT RESIDUE OR MG/L
	BLANK	BLANK				
P13	7145-0022		10.61	1.57	11.53	93.9
P14	7145-0023		11.13	1.58	10.74	82.3
P15	7145-0024		10.44	1.59	10.71	87.4
P16	7145-0025		10.86	1.57	11.01	86.9
P17	7145-0025 <sup>(D)</sup>		10.12	1.60	10.32	86.2

RPD =  $\frac{86.9 - 86.2}{86.6} \times 100 = 0.8$

CALCULATIONS: MG/L RESIDUE =  $\frac{(A-B) \times 1000000}{C}$

% TOTAL SOLIDS =  $\frac{(A-B) \times 100}{C}$

\*Weigh solids and report in %; take volume of aqueous samples and report in mg/L.  
Note which units results are reported in.

NOTE ANY COMMENTS ON BACK OF SHEET!!!  
=====

Reviewed by: MD Date: 8-3-93  
QC REVIEW BY: MD DATE: 8-3-93







No 016280

## CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJECT No. A51 55005901 gdc		PROJECT NAME A51 - HARDWOOD RANGE		CITY & STATE Necedah, WS		NO. OF CONTAINERS		REMARKS	
MPLERS (Signature) Ben Ford		DATE		TIME		STATION LOCATION		REMARKS	
AB No.	DATE	TIME	COMP.	GRAB	STATION LOCATION	GR0	PROC	PAH	REMARKS
145	7/28/93	NA		✓	HR-GT-SS-01	X			GR0 - Soil
146	7/28/93	NA		✓	HR-GT-SS-02		X		PRO - Soil
147	7/28/93	NA		✓	HR-GT-SN-01	X			GR0 - Soil
148	7/28/93	NA		✓	HR-GT-SN-02		X		PRO - Soil
149	7/28/93	NA		✓	HR-GT-SD-01	X			GR0 - Soil
150	7/28/93	NA		✓	HR-GT-SD-02		X		PRO - Soil
151	7/28/93	NA		✓	HR-GT-SL-01	X			GR0 - Soil
152	7/28/93	NA		✓	HR-GT-SL-02		X		PRO - Soil
153	7/28/93	NA		✓	HR-GT-SW-01	X			GR0 - Soil
154	7/28/93	NA		✓	HR-GT-SW-02		X		PRO - Soil
155	7/28/93	NA		✓	HR-GT-SE-01	X			GR0 - Soil
156	7/28/93	NA		✓	HR-GT-SE-02		X		PRO - Soil

Unlabeled by: (Signature) Ben Ford	Date / Time 7/29/93 93A	Received by: (Signature)	Date / Time	Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
Unlabeled by: (Signature)		Received by: (Signature)		Relinquished by: (Signature)		Received by: (Signature)	
Unlabeled by: (Signature)		Received for Laboratory by: (Signature) Ben Ford		Relinquished by: (Signature)		Received by: (Signature)	

PROJECT MANAGER: S. Tauscher

MARKS

Object used on ice hand delivered





**No 016281**

Page 3 of

## CHAIN OF CUSTODY RECORD

In fact, and on ice had deluded

## Distribution

**1-800-855-5555**

**File**

2

**Laboratory Reports and  
Chain-of-Custody Forms  
for August 9, 1993**



FILE COPY

August 12, 1993

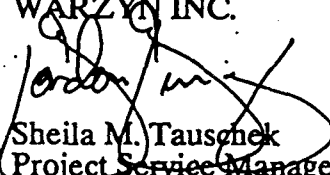
Mr. Joseph Hawk  
Advanced Science, Inc.  
165 Mitchell Road  
Oak Ridge, Tennessee 37830-7919

Dear Mr. Lawrence:

Enclosed are the analytical results and chain-of-custody for the samples collected August 9, 1993. Please feel free to call if you have any questions.

Sincerely,

WARZYN INC.

  
Sheila M. Tauschek  
Project Service Manager

SMT/kaf/GLG  
[var-ltrs]  
55005901-lab

THE PERFECT BALANCE  
BETWEEN TECHNOLOGY  
AND CREATIVITY

MADISON  
ONE SCIENCE COURT  
P.O. BOX 5385  
MADISON, WI 53705  
608/231-4747  
FAX 608/231-4777

CC: PROJECT FILES 9750.K-18.G



## STANDARD REPORT FOOTNOTES

- A1 Elevated quantitation limit due to low sample volume.
- A2 Elevated quantitation limit necessary to overcome interference.
- A3 Elevated quantitation limit necessary to overcome difficult matrix.
- A4 Result should be considered estimated with possible low bias due to unknown interference.
- A5 Result should be considered estimated with possible low bias due to difficult matrix.
- A6 Result should be considered estimated with possible low bias as indicated by method QC.
- A7 Result should be considered estimated with possible high bias due to unknown interference.
- A8 Result should be considered estimated with possible high bias due to difficult matrix.
- A9 Result should be considered estimated with possible high bias as indicated by method QC.
- A10 Result should be considered estimated due to non-homogeneous sample matrix.
- A11 Sample received past recommended hold time.
- A12 Analysis requested past recommended hold time.
- A13 Initial analysis performed within hold time; confirmation analysis performed past recommended hold time. Results from repeat analysis are reported.
- A14 Initial analysis performed within hold time; necessary dilution performed past recommended hold time. Results from repeat analysis are reported.
- A15 Result should be considered estimated with possible high bias; analyte detected in method blank.
- A16 Elevated quantitation limit indicated by batch QC.
- M2 Total analysis performed; total concentration indicates that TCLP regulatory level could not be exceeded.
- W1 Sample contained <0.5% solids; filtered sample was analyzed as the TCLP extract.
- G1 Result should be considered estimated, concentration exceeds working calibration range.
- G2 Elevated quantitation limit due to the concentration of petroleum hydrocarbons in the sample.
- G3 Elevated quantitation limit due to the concentration of non-specific hydrocarbons in the sample.
- G4 Analyte coelutes with \_\_\_\_\_; result calculated from calibration standards in a 1:1 ratio of these two compounds.
- G5 Sample required extensive cleanup; Endrin Aldehyde is not recovered from these techniques.
- G6 Petroleum-type odor detected from this sample.
- G7 Elevated quantitation limit due to the concentration of PCBs in the sample.
- G8 Result should be considered estimated with possible high bias due to coelution with an additional hydrocarbon product.
- G9 Results are influenced by the presence of extraneous peaks which are not representative of petroleum hydrocarbon products.
- G10 Presence of one or more unidentified peaks eluting earlier than the retention time window.
- G11 Presence of one or more unidentified peaks eluting later than the retention time window.
- G12 Result is estimated. The method used is a screening procedure for this compound.
- G13 Measurement performed using test strips.
- G14 Measurement upon receipt performed using test strips.
- G15 n-Nitrosodiphenylamine decomposes in the GC inlet and cannot be separated from Diphenylamine.
- G16 Measurement upon receipt performed using test strips. Adjusted to pH <2.
- G17 Results are influenced by the presence of extraneous peaks which are not representative of petroleum hydrocarbon products. Final results pending GC/MS confirmation.

# METHOD REFERENCES

Analytes	Soil/Groundwater				Wastewater			
	ICP	Flame	Furnace	CV	ICP	Flame	Furnace	CV
Aluminium	6010	7020	-	-	200.7	202.1	-	-
Antimony	6010	7040	7041	-	200.7	-	204.2	-
Arsenic	6010	-	7060	-	200.7	-	206.2	-
Barium	6010	7080	7081	-	200.7	208.1	208.2	-
Beryllium	6010	7090	7091	-	200.7	210.1	210.2	-
Cadmium	6010	7130	7131	-	200.7	213.1	213.2	-
Calcium	6010	7140	-	-	200.7	215.1	-	-
Chromium, Total	6010	7190	7191	-	200.7	218.1	218.2	-
Cobalt	6010	7200	-	-	200.7	219.1	-	-
Copper	6010	7210	-	-	200.7	220.1	-	-
Iron	6010	7380	-	-	200.7	236.1	-	-
Lead	6010	7420	7421	-	200.7	239.1	239.2	-
Magnesium	6010	7450	-	-	200.7	242.1	-	-
Manganese	6010	7460	-	-	200.7	243.1	-	-
Mercury	-	-	-	7470 / 7471	-	-	-	245.1
Molybdenum	6010	7480	-	-	200.7	246.1	-	-
Nickel	6010	7520	-	-	200.7	249.1	-	-
Potassium	-	SM322B	-	-	-	SM322B	-	-
Selenium	6010	-	7740	-	200.7	-	270.2	-
Silver	6010	7760	7761	-	200.7	272.1	272.2	-
Sodium	6010	SM325B	-	-	200.7	SM325B	-	-
Strontium	6010	-	-	-	200.7	-	-	-
Thallium	6010	7840	7841	-	200.7	279.1	279.2	-
Tin	6010	-	-	-	200.7	-	-	-
Titanium	6010	-	-	-	200.7	-	-	-
Vanadium	6010	7910	7911	-	200.7	286.1	286.2	-
Zinc	6010	7950	-	-	200.7	289.1	-	-

SW846, "Test Methods for Evaluating Solid Waste", 3rd Ed., December 1987.

EPA-600, "Method for Chemical Analysis of Water and Wastes", March 1984.

Standard Method for the Examination of Water and Wastewater", 16th Edition, 1985.

# METHOD REFERENCES

Analytes	Aqueous	Non-Aqueous
Acidity	305.2	-
Alkalinity, Total	310.1 / 310.2	-
Alkalinity, Phenolphthalein	SM2320	-
Alkalinity, Bicarbonate	SM2320	-
Alkalinity, Carbonate	SM2320	-
BOD-5 day	405.1	-
Boron	212.3	-
Carbon, Percent Organic	-	29-3.5.3
Carbon, Total Organic (TOC)	415.1	-
Chloride	325.2	-
Chlorine, Residual	330.3	-
Chromium, Hexavalent	SM3500D	-
COD	410.4	-
Cyanide, Total	335.3	9012
Cyanide, Amenable	335.1	9012
Cyanide, Reactive	SW7.3	SW7.3
Density	SM2710F	SM2710F
Flashpoint, Closed Cup	SW1010	SW1010
Flashpoint, Open Cup	ASTMD4206	ASTMD4206
Fluoride	340.2	-
Hardness, Total	130.1	-
Nitrogen, Ammonia	350.2	350.2
Nitrogen, Nitrate	353.2	-
Nitrogen, Nitrite	353.2	-
Nitrogen, Nitrate+Nitrite	353.2	-
Nitrogen, Total Kjeldahl (TKN)	351.3	351.3
Nitrogen, Total Organic (TON)	350.2 & 351.3	350.2 & 351.3
Oil & grease	413.1	9071
Paint Filter Test	9095	9095
pH	150.1	9045
Phenol, Total	420.2	9066
Phosphorus, Total	365.1	365.1
Phosphorus, Ortho	365.2	-
Solids, Total Dissolved	160.1	-
Solids, Total Suspended	160.2	-
Solids, Total	160.3	160.3
Solids, Total Volatile	160.4	-
Specific Conductance	120.1	-
Specific Weight	SM2710F	SM2710F
Sulfate	375.2	-
Sulfide, Total	376.1	9030
Sulfide, Reactive	SW7.3	SW7.3
Turbidity	180.1	-
TRPH	418.1 & 9073	418.1 & 9073

SW846, "Test Methods for Evaluating Solid Waste", 3rd Ed., December 1987.

EPA-600, "Methods for Chemical Analysis of Water and Wastes", March 1984.

Standard Methods for the Examination of Water and Wastewater", 17th Edition, 1989.

ASTM, Annual Book of American Society for Testing and Materials Standards, 1983, Volume 6.01.

Methods for Soil Analysis, 2nd Ed.





## METHOD REFERENCES

MADISON  
ONE SCIENCE COURT  
P.O. BOX 5385  
MADISON, WI 53705  
(608) 231 4347  
FAX (608) 231 4777

Compounds	Soil/Groundwater	Wastewater
Alcohol	8015*	8015*
BEXT	8020***	602
DRO	Modified DRO	Modified DRO
GRO	Modified GRO***	Modified GRO
Herbicides	8150	8150
Pesticides	8080	608
Pesticide/PCBs	8080	608
PCBs	8080**	608
PCBs	8080****	608
PCP Screen	8040****	8040****
PNA (GC/MS)	8270	8270
PNA (HPLC)	8310	8310
PVOCs	8020***	8020
SVOCs	8270	8270
TPH	D-3328-78*	D-3328-78*
TRPH	418.1 & 9073	418.1 & 9073
VOCs	8021	8021
VOCs	8010/8020***	601/602

SW846, "Test Methods for Evaluating Solid Waste", 3rd Ed., December 1987.

EPA-600, "Methods for Organic Chemical Analysis of Water and Wastes",  
March, 1984.

ASTM, "Annual Book of ASTM Standards", 1990.

Wisconsin DNR Modified 9073 TRPH, PUBL-SW-140, Wisconsin DNR,  
April 1992.

Wisconsin DNR Modified DRO, PUBL-SW-141, Wisconsin DNR, April 1992.

Wisconsin DNR Modified GRO, PUBL-SW-140, Wisconsin DNR, April 1992.

- \* With Modifications
- \*\* With Modifications for Oil Matrix
- \*\*\* With Modifications for Soil Gas Matrix
- \*\*\*\* With Modifications for Wipe Matrix



MADISON  
ONE SCIENCE COURT  
P.O. BOX 5385  
MADISON, WI 53705  
(608) 231-4747  
FAX (608) 231-4777

INORGANIC REPORT  
ASI-HARDWOOD RANGE  
NECEDAH WI  
Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Sample Date	Analysis Date
7181-0001	HR-GT-SW	Solids, Total	82.6	.5	Solid	%	09-AUG-93	11-AUG-93
7181-0002	HR-GT-SSW	Solids, Total	85.6	.5	Solid	%	09-AUG-93	11-AUG-93
7181-0003	HR-GT-SSE	Solids, Total	89.6	.5	Solid	%	09-AUG-93	11-AUG-93
7181-0004	HR-GT-SE	Solids, Total	88.5	.5	Solid	%	09-AUG-93	11-AUG-93
7181-0005	HR-DT-SS	Solids, Total	88.2	.5	Solid	%	09-AUG-93	11-AUG-93
7181-0006	HR-DT-SW	Solids, Total	87.2	.5	Solid	%	09-AUG-93	11-AUG-93
7181-0007	HR-DT-SW	Solids, Total	87.4	.5	Solid	%	09-AUG-93	11-AUG-93
7181-0008	HR-DT-SE	Solids, Total	84.4	.5	Solid	%	09-AUG-93	11-AUG-93
7181-0009	HR-DT-SS-D	Solids, Total	88.9	.5	Solid	%	09-AUG-93	11-AUG-93
7181-0012	HR-GT-WB	Lead	50.7	3	GroundH2O	ug/L	09-AUG-93	11-AUG-93
		pH (upon receipt)	< 2	2	GroundH2O	S.U.	09-AUG-93	
7181-0013	HR-DT-WB	Lead	49.6	3	GroundH2O	ug/L	09-AUG-93	11-AUG-93
		pH (upon receipt)	< 2	2	GroundH2O	S.U.	09-AUG-93	

Footnotes

Sample #	Test	Footnote
7181-0012	pH (upon receipt)	G14 - Measur performed on nitric preserved bottle.
7181-0013	pH (upon receipt)	G14 - Measur performed on nitric preserved bottle.

GASOLINE RANGE ORGANICS (GRO)

ASI-HARDWOOD RANGE

NECEDAH WI

Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7181-0001	HR-GT-SW	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					
7181-0002	HR-GT-SSW	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					
7181-0003	HR-GT-SSE	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					
7181-0004	HR-GT-SE	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					
7181-0005	HR-DT-SS	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					
7181-0006	HR-DT-SW	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09 AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					

Note: Results in mg/kg are reported on a dry weight basis.



GASOLINE RANGE ORGANICS (GRO)  
ASI-HARDWOOD RANGE  
NECEDAH WI  
Project Number: 55005901

MADISON  
ONE SCIENCE COURT  
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MADISON, WI 53705  
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Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7181-0007	HR-DT-SW	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					
7181-0008	HR-DT-SE	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					
7181-0009	HR-DT-SS-D	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					
7181-0010	METHANOL BLANK	Gasoline Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					

Note: Results in mg/kg are reported on a dry weight basis.

RL = Reporting Limit  
WI Lab Certification ID#: 113138300

Ch'd: *Kaq* App'd: *8/12/93*  
Date App'd: *8/12/93*



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GASOLINE RANGE ORGANICS (GRO)  
ASI-HARDWOOD RANGE  
NECEDAH WI  
Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7181-0011	DECON-HR-WD	Gasoline Range Organics	< 100	100	GroundH2O	ug/L	None	
		pH	< 2	2	GroundH2O	S.U.		G13
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					
7181-0012	HR-GT-WB	Gasoline Range Organics	< 100	100	GroundH2O	ug/L	None	
		pH	< 2	2	GroundH2O	S.U.		G13
		Sample Date:	09-AUG-93					
		Extract Date:	11-AUG-93					
		Analysis Date:	11-AUG-93					
7181-0013	HR-DT-WB	Gasoline Range Organics	< 100	100	GroundH2O	ug/L	None	
		pH	< 2	2	GroundH2O	S.U.		G13
		Sample Date:	09-AUG-93					
		Extract Date:	11-AUG-93					
		Analysis Date:	11-AUG-93					

RL = Reporting Limit  
WI Lab Certification ID#: 113138300

Ck'd: *Kes* App'd: *8/12/93*  
Date App'd: *8/12/93*

DIESEL RANGE ORGANICS (DRO)

ASI-HARDWOOD RANGE

NECEDAH WI

Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7181-0001	HR-GT-SW	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	10-AUG-93					
7181-0002	HR-GT-SSW	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					
7181-0003	HR-GT-SSE	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					
7181-0004	HR-GT-SE	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					
7181-0005	HR-DT-SS	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					
7181-0006	HR-DT-SN	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					

Note: Results in mg/kg are reported on a dry weight basis.

RL = Reporting Limit

WI Lab Certification ID#: 113138300

Ck'd: *Kaf* App'd: *8/12/93*  
Date App'd: *8/12/93*



WARZYN

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DIESEL RANGE ORGANICS (DRO)  
ASI-HARDWOOD RANGE  
NECEDAH WI  
Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum	Footnotes
							Odor	
7181-0007	HR-DT-SW	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					
7181-0008	HR-DT-SE	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					
7181-0009	HR-DT-SS-D	Diesel Range Organics	< 10	10	Solid	mg/kg	None	
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					

Note: Results in mg/kg are reported on a dry weight basis.

RL = Reporting Limit

WI Lab Certification ID#: 113138300

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Ck'd: *Kef* App'd: *8/12/93*  
Date App'd: *8/12/93*



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DIESEL RANGE ORGANICS (DRO)

ASI-HARDWOOD RANGE

NECEDAH WI

Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Petroleum Odor	Footnotes
7181-0011	DECON-HR-WD	Diesel Range Organics pH	< 100	100	GroundH2O GroundH2O	ug/L S.U.	None	(a)
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					
7181-0012	HR-GT-WB	Diesel Range Organics pH	< 100	100	GroundH2O GroundH2O	ug/L S.U.	None	(a)
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					
7181-0013	HR-DT-WB	Diesel Range Organics pH	< 100	100	GroundH2O GroundH2O	ug/L S.U.	None	(a)
		Sample Date:	09-AUG-93					
		Extract Date:	10-AUG-93					
		Analysis Date:	11-AUG-93					

(a) Label on sample bottle indicated HCL was added but actual pH was not taken during sample receipt.



PETROLEUM VOLATILE ORGANIC (PVOC) REPORT  
ASI-HARDWOOD RANGE  
NECEDAH WI  
Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Footnotes
7181-0012	HR-GT-WB	Benzene	< 1	1	GroundH2O	ug/L	
		Methyl tert-butyl ether	< 1	1	GroundH2O	ug/L	
		Ethylbenzene	< 1	1	GroundH2O	ug/L	
		Toluene	< 1	1	GroundH2O	ug/L	
		1,2,4-Trimethylbenzene	< 1	1	GroundH2O	ug/L	
		1,3,5-Trimethylbenzene	< 1	1	GroundH2O	ug/L	
		m + p-Xylene	< 2	2	GroundH2O	ug/L	
		o-Xylene	< 1	1	GroundH2O	ug/L	
		pH	< 2	2	GroundH2O	S.U.	G13
Sample Date:		09-AUG-93					
Analysis Date:		11-AUG-93					
7181-0013	HR-DT-WB	Benzene	< 1	1	GroundH2O	ug/L	
		Methyl tert-butyl ether	< 1	1	GroundH2O	ug/L	
		Ethylbenzene	< 1	1	GroundH2O	ug/L	
		Toluene	< 1	1	GroundH2O	ug/L	
		1,2,4-Trimethylbenzene	< 1	1	GroundH2O	ug/L	
		1,3,5-Trimethylbenzene	< 1	1	GroundH2O	ug/L	
		m + p-Xylene	< 2	2	GroundH2O	ug/L	
		o-Xylene	< 1	1	GroundH2O	ug/L	
		pH	< 2	2	GroundH2O	S.U.	G13
Sample Date:		09-AUG-93					
Analysis Date:		11-AUG-93					
7181-0014	TRIP BLANK	Benzene	< 1	1	GroundH2O	ug/L	
		Methyl tert-butyl ether	< 1	1	GroundH2O	ug/L	
		Ethylbenzene	< 1	1	GroundH2O	ug/L	
		Toluene	< 1	1	GroundH2O	ug/L	
		1,2,4-Trimethylbenzene	< 1	1	GroundH2O	ug/L	
		1,3,5-Trimethylbenzene	< 1	1	GroundH2O	ug/L	
		m + p-Xylene	< 2	2	GroundH2O	ug/L	
		o-Xylene	< 1	1	GroundH2O	ug/L	
		pH	< 2	2	GroundH2O	S.U.	G13
Sample Date:		09-AUG-93					
Analysis Date:		11-AUG-93					



MADISON  
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PNA/PAH (HPLC) ORGANIC REPORT

ASI-HARDWOOD RANGE

NECEDAH WI

Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Footnotes
7181-0012	HR-GT-WB	Naphthalene	< 10	10	GroundH2O	ug/L	
		Acenaphthylene	< 10	10	GroundH2O	ug/L	
		Acenaphthene	< 18	18	GroundH2O	ug/L	
		Fluorene	< 2	2	GroundH2O	ug/L	
		Phenanthrene	< 1	1	GroundH2O	ug/L	
		Anthracene	< 1	1	GroundH2O	ug/L	
		Fluoranthene	< 2	2	GroundH2O	ug/L	
		Pyrene	< 1	1	GroundH2O	ug/L	
		Chrysene	< 1	1	GroundH2O	ug/L	
		Benzo(a)anthracene	< .1	.1	GroundH2O	ug/L	
		Benzo(b)fluoranthene	< .18	.18	GroundH2O	ug/L	
		Benzo(k)fluoranthene	< .1	.1	GroundH2O	ug/L	
		Benzo(a)pyrene	< .1	.1	GroundH2O	ug/L	
		Indeno(1,2,3-cd)pyrene	< .1	.1	GroundH2O	ug/L	
		Dibenzo(a,h)anthracene	< .2	.2	GroundH2O	ug/L	
		Benzo(g,h,i)perylene	< .2	.2	GroundH2O	ug/L	
		1-Methylnaphthalene	< 10	10	GroundH2O	ug/L	
		2-Methylnaphthalene	< 10	10	GroundH2O	ug/L	

Sample Date: 09-AUG-93

Extract Date: 10-AUG-93

Analysis Date: 10-AUG-93

RL = Reporting Limit

WI Lab Certification ID#: 113138300

Ck'd: *Ked* App'd: *JP*  
Date App'd: *8/12/93*



MADISON  
ONE SCIENCE COURT  
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PNA/PAH (HPLC) ORGANIC REPORT  
ASI-HARDWOOD RANGE  
NECEDAH WI  
Project Number: 55005901

Sample #	Site	Test	Result	RL	Matrix	Units	Footnotes
7181-0013	HR-DT-WB	Naphthalene	< 10	10	GroundH2O	ug/L	
		Acenaphthylene	< 10	10	GroundH2O	ug/L	
		Acenaphthene	< 18	18	GroundH2O	ug/L	
		Fluorene	< 2	2	GroundH2O	ug/L	
		Phenanthrene	< 1	1	GroundH2O	ug/L	
		Anthracene	< 1	1	GroundH2O	ug/L	
		Fluoranthene	< 2	2	GroundH2O	ug/L	
		Pyrene	< 1	1	GroundH2O	ug/L	
		Chrysene	< 1	1	GroundH2O	ug/L	
		Benzo(a)anthracene	< .1	.1	GroundH2O	ug/L	
		Benzo(b)fluoranthene	< .18	.18	GroundH2O	ug/L	
		Benzo(k)fluoranthene	< .1	.1	GroundH2O	ug/L	
		Benzo(a)pyrene	< .1	.1	GroundH2O	ug/L	
		Indeno(1,2,3-cd)pyrene	< .1	.1	GroundH2O	ug/L	
		Dibenzo(a,h)anthracene	< .2	.2	GroundH2O	ug/L	
		Benzo(g,h,i)perylene	< .2	.2	GroundH2O	ug/L	
		1-Methylnaphthalene	< 10	10	GroundH2O	ug/L	
		2-Methylnaphthalene	< 10	10	GroundH2O	ug/L	

Sample Date: 09-AUG-93  
Extract Date: 10-AUG-93  
Analysis Date: 10-AUG-93

RL = Reporting Limit

WI Lab Certification ID#: 113138300

10

Clk'd: *Ref* App'd: *8/12/93*  
Date App'd: *8/12/93*

Test: Total Solids  
Method SOP: TS2

Page 1 of 2  
C#: 55005901  
Analyst: P. MICHOK

Sample Information:

Date Sampled: 8-9-93  
Date of Analysis: 8-11-93  
Holding Time Exceeded? (7. days) Y (N)  
Matrix: Water (S01) Other \_\_\_\_\_ (circle one)

Sample Handling: refrigerated? (Y) N  
preservation type? NONE

QC ENTERED  
DATE: \_\_\_\_\_

Instrument Information:

Analytical Balance ID: Cahn Sartorius (circle one)  
Top Loading Balance ID: Sartorius AND (circle one)  
Oven: KISHER ISOTEMP (NOTE OTHER)

DISH #	LAB #	SAMPLE DESCRIPTION	SAMPLE ML OR GM*	(B) WEIGHT DISH GM	(A) DISH + RESIDUE GM	RESULT RESIDUE <u>(%)</u> OR MG/L
P1	BLANK	BLANK		1.59	1.59	<0.5
P2	7181-0001		10.66	1.58	10.38	82.6
P3	7181-0002		10.21	1.60	10.34	85.6
P4	7181-0002 <u>(6)</u>		10.17	1.59	10.31	85.7
P5	7181-0003		10.53	1.60	11.04	89.6
P6	7181-0004		10.30	1.58	10.70	88.5
P7	7181-0005		10.51	1.59	10.86	88.2
P8	7181-0006		10.10	1.59	10.40	87.2
P9	7181-0007		10.96	1.58	11.16	87.4
P10	7181-0008		10.61	1.58	10.53	84.4
P11	7181-0009		10.98	1.58	11.34	88.9

RPD:  $\frac{85.7-85.6}{100} = 0.1\%$

CALCULATIONS: MG/L RESIDUE =  $\frac{(A-B) \times 1000000}{C}$

% TOTAL SOLIDS =  $\frac{(A-B) \times 100}{C}$

\*Weigh solids and report in %; take volume of aqueous samples and report in mg/L.  
Note which units results are reported in:

NOTE ANY COMMENTS ON BACK OF SHEET!!!

Reviewed by: lcut Date: 8/11/93  
QC REVIEW BY: lcut DATE: 8/11/93



## Sample Information

Date Sampled 8/9/93Date of Analysis 8/11/93

## Sample Prep Information:

Date Digested 8/10/93 By ECDDigestion SOP# WWEPDIGBalance Used \_\_\_\_\_

Lab #	Sample Matrix	Conc. ug/L	Manual Dilution	Conc. ug/L	Conc. mg/L	Digested Dilution	Final Conc. Units:
						$\frac{50\text{ml}}{50\text{ml}}$	$\frac{\text{ug}}{\text{L}}$
Diq.Blk	—	-0.25	—	—			<3.0
Diq.Std *	—	19.51	—	—			$\frac{19.51}{20.0} = 97.6\%$
7181-0012	GW	25.33	$\frac{1}{2}$	50.66			50.7
7181-0012 SPK *		34.10	$\frac{1}{2}$	68.20			$\frac{68.20 - 50.66}{20.0} = 87.7\%$
7181-0013		49.60	—	—			49.6
7181-0013 DUP	↓	48.46	—	—		↓	48.5 $\frac{48.5}{48.5} = 100\%$
20.00 STD	—	18.72	—	—		—	$\frac{18.72}{20.0} = 93.6\%$
50.00 STD	—	48.04	—	—		—	$\frac{48.04}{50.0} = 96.1\%$

Log in  
7181Ph L2  
per COE  
Rec'd 8/12/93

Comments:

\* 20 Pb.

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_



1 Wt  
8/2/93

# Varian SpectraA 300/400 Zeeman Report

Instrument: V 4002 A  
Varian Inc., Madison, Wisconsin

OPERATOR SBS  
DATE 8/11/93  
BATCH 24588

PROGRAM 22 Pb

INSTRUMENT MODE	ABSORBANCE
CALIBRATION MODE	CONCENTRATION
MEASUREMENT MODE	PEAK AREA
LAMP POSITION	1
LAMP CURRENT (mA)	4
SLIT WIDTH (nm)	0.5
SLIT HEIGHT	NORMAL
WAVELENGTH (nm)	263.3
SAMPLE INTRODUCTION	SAMPLER PREMIXED
TIME CONSTANT	0.05
MEASUREMENT TIME (sec)	1.0
REPLICATES	2
BACKGROUND CORRECTION	ON
MAXIMUM ABSORBANCE	1.40

## FURNACE PARAMETERS

STEP NO.	TEMPERATURE (C)	TIME (sec)	GAS FLOW (L/min)	GAS TYPE	READ COMMAND
1	220	1.0	3.0	NORMAL	NO
2	240	35.0	3.0	NORMAL	NO
3	240	5.0	3.0	NORMAL	NO
4	650	5.0	3.0	NORMAL	NO
5	650	15.0	3.0	NORMAL	NO
6	650	1.0	0.0	NORMAL	NO
7	2200	0.9	0.0	NORMAL	YES
8	2200	2.0	0.0	NORMAL	YES
9	2500	2.0	3.0	NORMAL	NO

## SAMPLER PARAMETERS VOLUMES (µL)

	SOLUTION	BLANK	MODIFIER
BLANK	--	20	5
STANDARD 1	20	0	5
STANDARD 2	20	0	5
STANDARD 3	20	0	5
STANDARD 4	20	0	5
SAMPLE	20	0	5

RECALIBRATION RATE 0  
RESLOPE RATE 0

# INJECT RATE 1

SAMPLE	CONC uo/l	%RSD	MEAN ABS	READINGS
--------	--------------	------	-------------	----------

BLANK	0.00		-0.006	-0.010	-0.002
STANDARD 1	3.00	43.6	0.036	0.032	0.037
STANDARD 2	10.00	1.4	0.088	0.087	0.089
BLANK	0.00		0.000	-0.001	0.001
STANDARD 1	3.00	6.8	0.021	0.020	0.022
STANDARD 2	10.00	4.1	0.064	0.062	0.066
STANDARD 3	20.00	2.1	0.128	0.126	0.130
STANDARD 4	50.00	1.6	0.302	0.299	0.302
5.00	5.57	8.6	0.038	0.040	0.035
BLK	0.47	28.0	0.003	0.004	0.002
SPEX XWE-12	20.58	0.1	0.132	0.132	0.132
DIG.BLK.7177	0.92	27.3	0.007	0.008	0.005
DIG.STD.	39.72	0.6	0.247	0.246	0.248
7177-0001	1.84	0.9	0.013	0.013	0.013
7177-0001 S	35.91	0.3	0.226	0.226	0.225
7177-0001 D	1.84	7.2	0.013	0.014	0.012
10.00	10.58	0.9	0.068	0.067	0.068
DIG.BLK.7181	0.93	14.3	0.007	0.007	0.006

Pen. broke skelizer

Reset. Carry-over.  
SS 8/1/93

BLANK	0.00		-0.001	-0.001	-0.001
5.00	4.80	0.8	0.033	0.033	0.032
BLK	-0.23	63.6	-0.002	-0.001	-0.003
SPEX XWE-12	19.93	0.2	0.128	0.126	0.127
DIG.BLK.7177	0.40	67.8	0.003	0.003	0.003
DIG.STD.	38.98	1.1	0.243	0.241	0.242
7177-0001	1.22	3.6	0.009	0.008	0.009
7177-0001 S	34.25	1.0	0.216	0.217	0.214
7177-0001 D	0.98	59.6	0.007	0.010	0.004
10.00	9.77	1.4	0.063	0.063	0.062
DIG.BLK.7181	-0.25	68.0	-0.002	-0.001	-0.003
DIG.STD.	19.51	0.2	0.125	0.125	0.125
7181-0012	47.59	1.1	0.300	0.298	0.303
7181-0012 S	OVER	0.3	0.381	0.386	0.382
7181-0013	49.60	0.4	0.300	0.299	0.301
7181-0013 D	48.46	1.5	0.294	0.298	0.291
20.00	18.72	0.3	0.120	0.120	0.120
BLK	-0.94	20.7	-0.007	-0.006	-0.006
At 7181-0012 (1/2)	25.33	0.6	0.162	0.162	0.161
At 7181-0012 (1/2)	34.10	0.4	0.215	0.214	0.216
At 50.00	48.04	1.0	0.292	0.294	0.290

Reset at dilution. SS 8/1/93

SS 8/1/93

**WISCONSIN LUST PROGRAM**  
**GASOLINE RANGE ORGANICS ANALYSIS (GRO)**  
**DATA SHEET - WATER**  
**WARZYN ANALYTICAL SERVICES**

C#: 55005901  
 Batch #: 24590  
 Logbook/Page: 5890/7, 8  
 Calc. by/Date: A.J.K./8-11-93

Results in ug/L							
Date Analyzed:		8/10/93	8/11/93				
Warzyn Sample #		BLK 8-10-93	BLK 8-11-93				
Sample I.D.		METHOD BLANK	METHOD BLANK				
Dilution Factor *		1	1				
Hydrocarbon	Reporting Limit						
GRO	100	< 100	< 100				
pH							
Odor		NO	NO				

\* Multiply reporting limits by dilution factor to obtain corrected sample-specific quantitation limits.

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Method Reference: LUST Modified GRO, WI DNR

Reviewed by: JLW 8-12-93  
 Approved by: 8-12-93



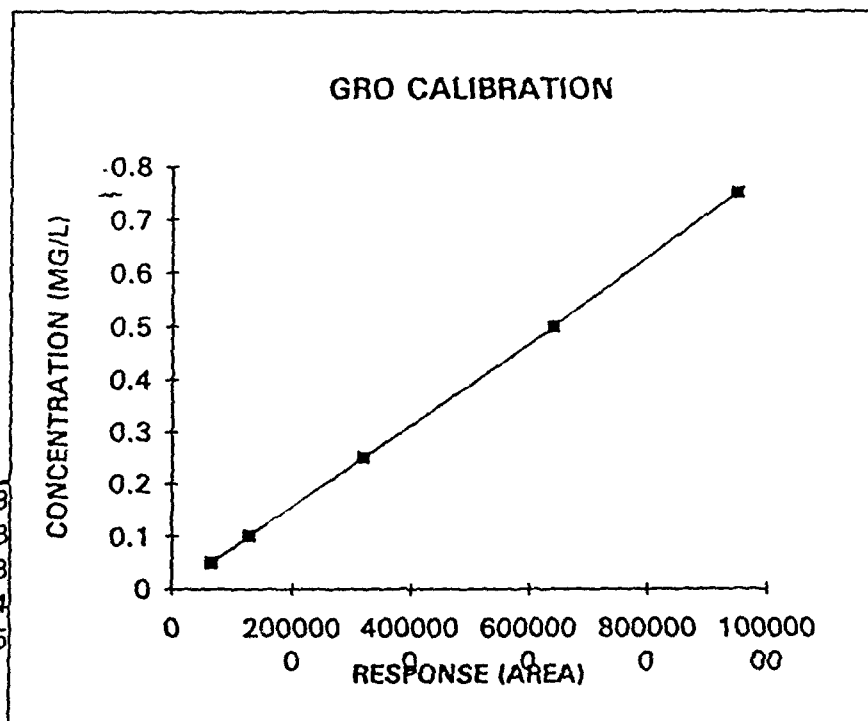
## WISCONSIN GRO INITIAL CALIBRATION

Date: 7/27/93Standard Lot#: MC 1231 INSTRUMENT ID: HP5890Reference to  
Batch # 24422  
CJL 8-3-93

Total Response (Area;X)	Total GRO Concentration (mg/L;Y)	Actual Conc. from curve
654961	0.05	0.050175
1265878	0.1	0.098328
3190382	0.25	0.250018
6411587	0.5	0.503915
9502759	0.75	0.747563
12834955	1	1.010208

Y-Intercept : 0.0003826  
 Slope: 7.81944E-08  
 R squared: 0.99990939

Calibration	Array
7.82E-08	0.000383
3.72E-10	0.002668
0.999909	0.00403
44141.39	4
0.717018	6.5E-05



Calculated By/Date : CJL 7-28-93  
 Reviewed By/Date : CLK 8-3-93  
 Approved By/Date : AML 8-03-93

## WISCONSIN GRO SURROGATE CALIBRATION

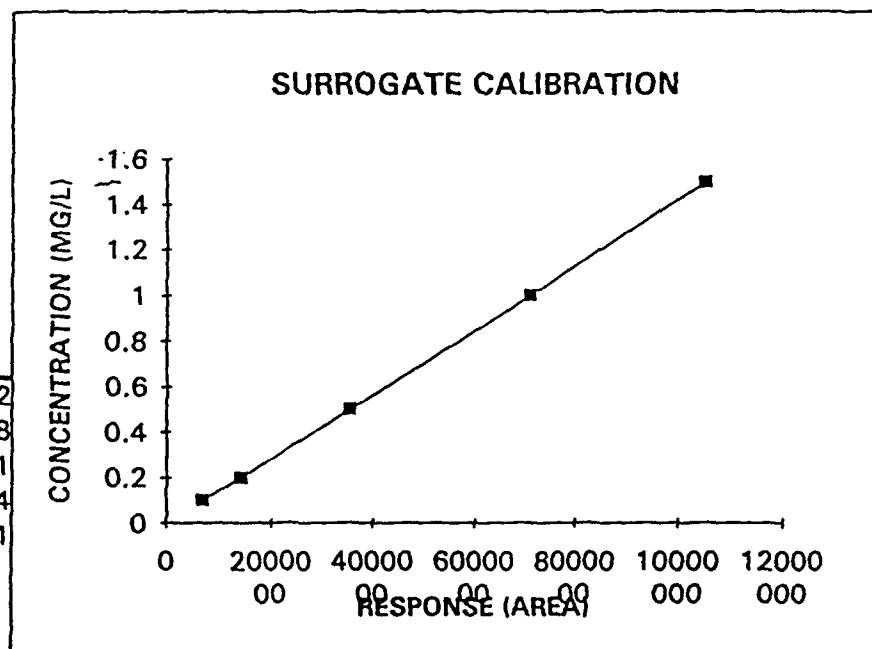
Date: 7/27/93

INSTRUMENT ID: HP5890

Total Response (Area;X)	Total Surrogate Concentration (mg/L;Y)
675619	0.1
1411206	0.2
3552334	0.5
7114013	1
10560577	1.5
14359925	2

Y-Intercept : 0.005901514  
 Slope: 1.39742E-07  
 R squared: 0.999822216

Calibration	Array
1.4E-07	0.005902
9.32E-10	0.007448
0.999822	0.011291
22495.16	4
2.867823	0.00051



Calculated By/Date : A.J.K. / 7-28-93  
 Reviewed By/Date : CAK / 8-3-93  
 Approved By/Date : Paul / 08-03-93

# WISCONSIN GRO SOIL COMPONENT SPIKE FORM

Batch #: 24590  
Date Analyzed : 8/11/93  
Instrument ID : 5890  
Spike Solution Lot 3 : ME 1521

## GRO SOIL SPIKE #1

Amount Spiked (mg/Kg)	Total Response (Area)	Spike Concentration (mg/Kg)	Percent Recovery (%)
50	9820718	38.42	76.8%

## GRO SOIL SPIKE #2

Amount Spiked (mg/Kg)	Total Response (Area)	Spike Concentration (mg/Kg)	Percent Recovery (%)	Percent Difference (%D)
50	10291880	40.26	80.5%	4.7%

## QC Limits

Percent Recovery : 69 - 158 %

RPD Limits : +/- 20%

\* = Outside QC Limits

Calculated By/Date : A.J.K./8-11-93  
Reviewed By/Date : 218-18-93  
Approved By/Date : 218-12-93

# WISCONSIN GRO SOIL COMPONENT SPIKE FORM

Batch #: 24590  
Date Analyzed: 8/10/93  
Instrument ID: 5890  
Spike Solution Lot 3: ME 1521

## GRO SOIL SPIKE #1

Amount Spiked (mg/Kg)	Total Response (Area)	Spike Concentration (mg/Kg)	Percent Recovery (%)
50	9796160	38.32	76.6%

## GRO SOIL SPIKE #2

Amount Spiked (mg/Kg)	Total Response (Area)	Spike Concentration (mg/Kg)	Percent Recovery (%)	Percent Difference (%D)
50	10434887	40.82	81.6%	6.3%

## QC Limits

Percent Recovery : 69 - 158 %

RPD Limits : +/- 20%

\* = Outside QC Limits

Calculated By/Date : 0.119/8-11-93  
Reviewed By/Date : 248-12-93  
Approved By/Date : 248-12-93

# SCONSIN GRO WATER COMPONENT SPIKE FORM

Batch # : 24590  
 Date Analyzed : 8/10/93  
 Instrument ID : 5890  
 Spike Solution Lot 3 : ME 1521

## GRO COMPONENT SPIKE

Amount Spiked (ug/l)	Total Response (Area)	Spike Concentration (ug/L)	Percent Recovery (%)
100	1529610	120	120.0%

## GRO COMPONENT SPIKE DUPLICATE

Amount Spiked (ug/l)	Total Response (Area)	Spike Concentration (ug/L)	Percent Recovery (%)	Percent Difference (%)
100	1529074	120	120.0%	0.0%

### QC Limits

Percent Recovery : 81 -145 %  
 Percent Difference : +/- 20 %

Calculated By/Date : 0.1.9.18-11-93  
 Reviewed By/Date : AGW 8-12-93  
 Approved By/Date : 248.12-93

# WISCONSINGRO SURROGATE RECOVERY FORM

Batch # : 24590  
 Dates of Analysis: 8/10-11/93  
 Instrument ID : 5890  
 Calc. by/ Date: A.J.K./8-11-93

	Sample Number	Matrix	Total Surrogate Response (Area)	Conc. (mg/L)	Percent Recovery (%)	PASS/*FAIL*
1)	BLANK 8/10/93	WATER	788965	0.116	116	PASS
2)	BLANK 8/11/93	WATER	771892	0.114	114	PASS
3)	7181-0001	"SOIL"	779360	0.115	115	PASS
4)	7181-0002	"SOIL"	761054	0.112	112	PASS
5)	7181-0003	"SOIL"	764954	0.113	113	PASS
6)	7181-0003R	"SOIL"	851757	0.125	125	PASS
7)	7181-0004	"SOIL"	794438	0.117	117	PASS
8)	7181-0005	"SOIL"	814114	0.120	120	PASS
9)	7181-0006	"SOIL"	792975	0.117	117	PASS
10	7181-0007	"SOIL"	777963	0.115	115	PASS
11	7181-0008	"SOIL"	790488	0.116	116	PASS
12	7181-0009	"SOIL"	788462	0.116	116	PASS
13	7181-0010	"SOIL"	815796	0.120	120	PASS
14	7181-0011	WATER	761316	0.112	112	PASS
15	7181-0012	WATER	728534	0.108	108	PASS
16	7181-0013	WATER	756529	0.112	112	PASS
17	SPK 8/10/93	WATER	804556	0.118	118	PASS
18	SPKDUP 8/10/93	WATER	837419	0.123	123	PASS
19	SLSPK 8/10/93	"SOIL"	795746	0.117	117	PASS
20	SLSPKDUP 8/10/93	"SOIL"	748729	0.111	111	PASS
21	SLSPK 8/11/93	"SOIL"	806038	0.119	119	PASS
22	SLSPKDUP 8/11/93	"SOIL"	816945	0.120	120	PASS
23)						
24)						
25)						

QC Limits (Water) = 89-162%  
 QC Limits (Soil) = 56-144%

Reviewed By/Date:

Approved By/Date:

Jaw 8-10-93  
8-10-93

# WISCONSIN GRO CCV RECOVERY FORM

Batch # : 24590  
Dates of Analysis: 8/10-11/93  
Instrument ID : 5890

	Continuing Calibration Std. (Waters File ID) (at 0.9984 mg/L)	Date Analyzed	Total GRO Response (Area)	Conc. (mg/L)	Percent Recovery (%)	Pass/Fail
1)	CHKSTD 8/10/93	8/10/93	1362386	0.107	107	PASS
2)	ENDCHK 8/10/93	8/11/93	1195337	0.094	93.9	PASS
3)	CHKSTD 8/11/93	8/11/93	1347552	0.106	106	PASS
4)						
5)						
6)						
7)						
8)						
9)						
10)						
11)						
12)						
13)						
14)						
15)						
16)						
17)						
18)						
19)						
20)						
21)						
22)						
23)						
24)						
25)						

QC Limits = 80.0% - 120%

Calculated By/Date:  
Reviewed By/Date:  
Approved By/Date:

A.J.K. / 8-11-93  
J.C.W. 8-12-93  
R.H. 8-12-93

**WISCONSIN LUST PROGRAM**  
**DIESEL RANGE ORGANICS ANALYSIS (DRO)**  
**DRO SPIKE/DUPLICATE - WATER**  
**WARZYN ANALYTICAL SERVICES**

C#: 55005901  
Date Analyzed: 8/10/93  
Batch #: 24579  
Date Extracted: 8/10/93  
Logbook/Page: (3/75) 4/1  
Calc. by/Date: CMK/8/11/93  
SERIAL #

QC ENTERED  
DATE: \_\_\_\_\_

**DRO SPIKE**

AREA	SPIKE CONC. UG/ML	MEASURED CONC. UG/ML	%R
857827	200	226.6	113.3%✓

**DRO SPIKE DUPLICATE**

AREA	SPIKE CONC. (UG/ML)	MEASURED CONC. (UG/ML)	%R
718877	200	186.9	93.4%

QC Limits = 50-150%

Reviewed By/Date: Saw 8/12/93  
Approved By/Date: CMK 8/12/93



**WISCONSIN LUST PROGRAM**  
**DIESEL RANGE ORGANICS ANALYSIS (DRO)**  
**DRO SPIKE/DUPLICATE - SOLID**  
**WARZYN ANALYTICAL SERVICES**

C#: 55005901  
Date Analyzed: 8/10/93 *8/11/93*  
Batch #: 24579  
Date Extracted: 8/10/93  
Logbook/Page: 3/75, (4/1)  
Calc. by/Date: CMK/8/11/93  
SERIAL #

QC ENTERED  
DATE: \_\_\_\_\_

**DRO SPIKE**

AREA	SPIKE CONC. UG/ML	MEASURED CONC. UG/ML	%R
1099603	8.0	11.8	147.9%

**DRO SPIKE DUPLICATE**

AREA	SPIKE CONC. UG/ML	MEASURED CONC. UG/ML	%R
754349	8.0	7.9	98.5%

QC Limits = 50-150%

Reviewed By/Date: *Sam* 8/12/93  
Approved By/Date: \_\_\_\_\_

# PVOC SURROGATE RECOVERY FORM

Batch#: 24592

Date(s) of Run: 8-10-93

Calc. by/date: A.J.X. / 8-11-53

HPSSGO

[illegible]

**Comments:** \_\_\_\_\_

\* Outside of QC Limits 0 of 7 outside of QC Limits

Reviewed by: Jew  
Date: 8-11-93

# PVOC VOLATILE METHOD BLANK SUMMARY SHEET

Batch#: 24592

Instrument ID: HPS890

Date of Run: 8-10-93

Lab. By/Date: AJK. / 8-11-93

Concentration - ug/L

Compounds	Blank ID (8-10-93)	Blank ID ( )	Blank ID ( )	Blank ID ( )
Benzene	21.0			
tert-Butyl methyl ether				
Ethylbenzene				
Toluene				
1,2,4-Trimethylbenzene				
1,3,5-Trimethylbenzene				
Xylene	43.0			

NR = Not Requested

Reviewed By: JW  
Date: 8-11-93

ersion: 860/V2.2

Printed: 28-Jul-1993 at 15:37:52

Page 1

GC Project: HP5890

User: WVKOTLAREK

ers GC Calibration Method WIGVOC

annel 1

Channel Parameters:

Calibrate Channel ? YES  
Retention Time Offset 0.00 sec  
Relative Peak Window 7%  
Absolute Peak Window 20 sec  
Update Retention Time ? NO

Reference  
To Gndcll #  
24423  
28-96  
8-3-93

Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
MTBE	6.35	Linear	7	Height		1

Peak Name	Coefficients
MTBE	A = -3.264756e+02 B = 3.892445e+02 R <sup>2</sup> = 0.998850

Level Table:

Peak Name: MTBE Retention Time: 6.35 min

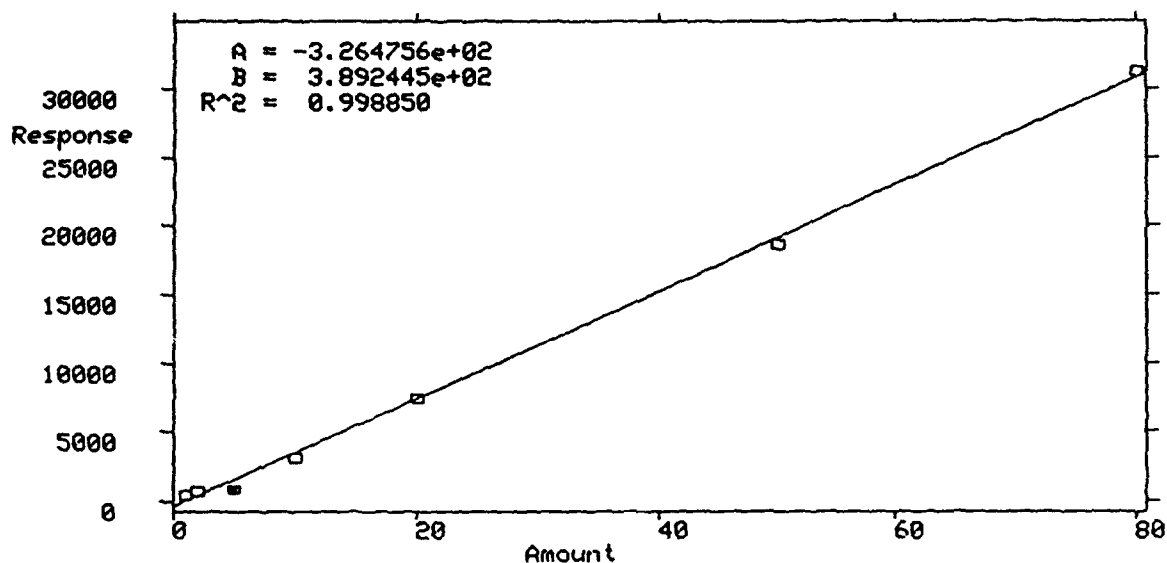
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	447.000000*	1	0.00	YES
2	2.000000	711.000000*	1	0.00	YES
3	5.000000	842.000000*	1	0.00	NO
4	10.000000	3129.000000*	1	0.00	YES
5	20.000000	7399.000000*	1	0.00	YES
6	50.000000	18589.000000*	1	0.00	YES
7	80.000000	31213.000000*	1	0.00	YES

\* A manual response was entered for this level.

nel 1 (continued)

rves:

LC Calibration Method WIGVOC Peak MTBE Channel 1



Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
BENZENE	11.87	Linear	7	Height		1

Peak Name	Coefficients
BENZENE	A = -1.805573e+03 B = 1.965003e+03 R^2 = 0.999048

Level Table:

Peak Name: BENZENE Retention Time: 11.87 min

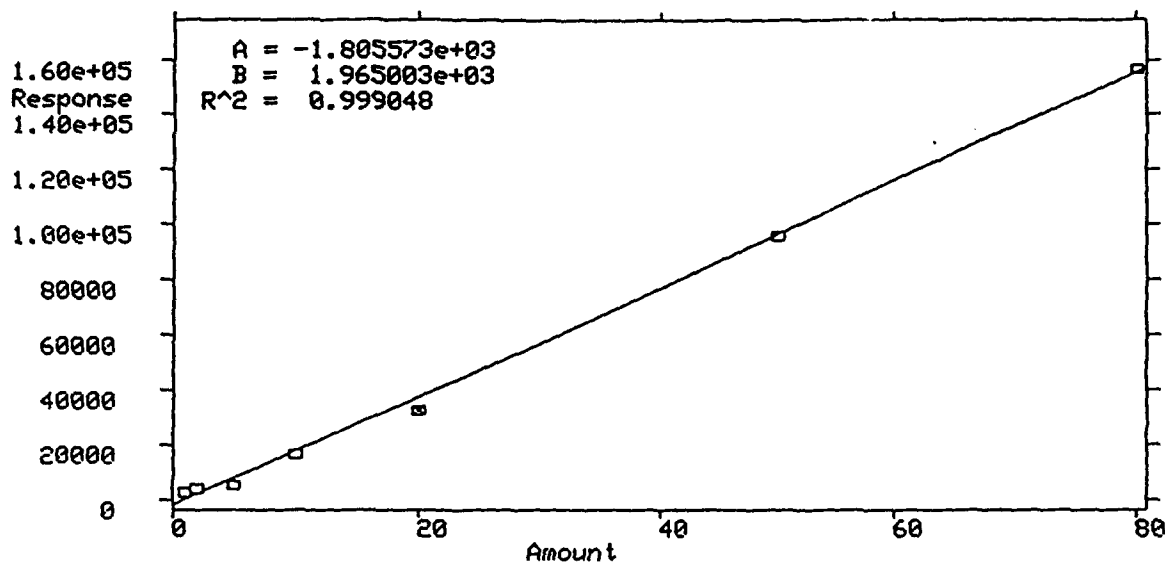
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2533.000000*	1	0.00	YES
2	2.000000	3917.000000*	1	0.00	YES
3	5.000000	5167.000000*	1	0.00	YES
4	10.000000	16553.000000*	1	0.00	YES
5	20.000000	32350.000000*	1	0.00	NO
6	50.000000	95678.000000*	1	0.00	YES
7	80.000000	156139.000000*	1	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method WIGVOC Peak BENZENE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R	I	D	Group
AAATFT	13.94	Linear	7	Height	X			1

Peak Name	Coefficients
AAATFT	$A = 1.298172e+02$ $B = 7.597755e+02$ $R^2 = 0.997345$

## Level Table:

Peak Name: AAATFT Retention Time: 13.94 min

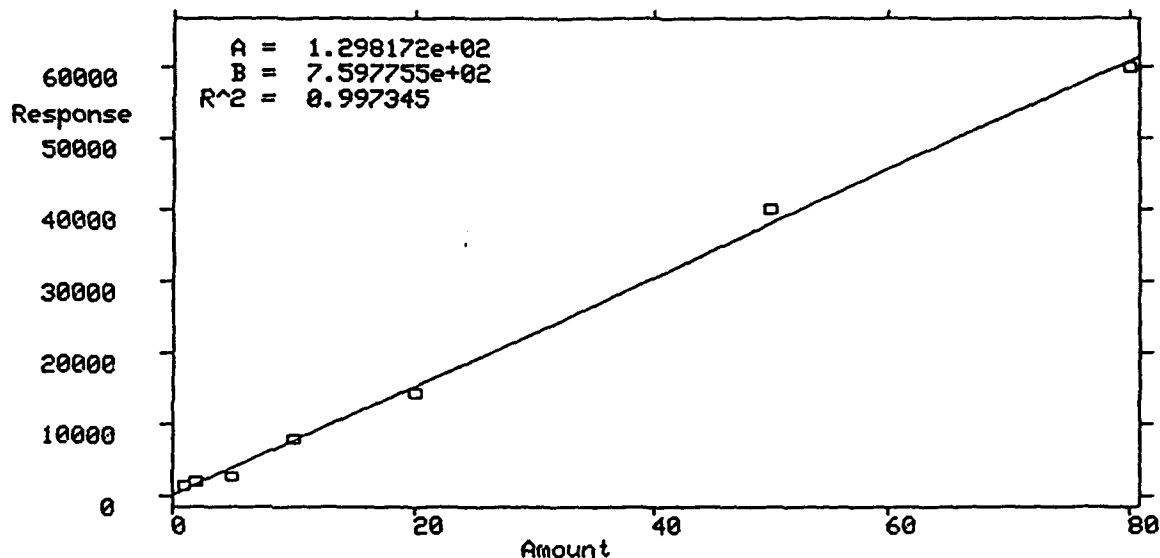
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	1515.000000*	1	0.00	YES
2	2.000000	1996.000000*	1	0.00	YES
3	5.000000	2669.000000*	1	0.00	YES
4	10.000000	7936.000000*	1	0.00	YES
5	20.000000	14357.000000*	1	0.00	YES
6	50.000000	40170.000000*	1	0.00	YES
7	80.000000	59908.000000*	1	0.00	YES

\* A manual response was entered for this level.

## Channel 1 (continued)

## Curves:

LC Calibration Method WIGVOC Peak AATFT Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
TOLUENE	17.58	Linear	7	Height		1

Peak Name Coefficients  
 TOLUENE A = -2.083429e+02  
 B = 1.566145e+03  
 R^2 = 0.998928

## Level Table:

Peak Name: TOLUENE Retention Time: 17.58 min

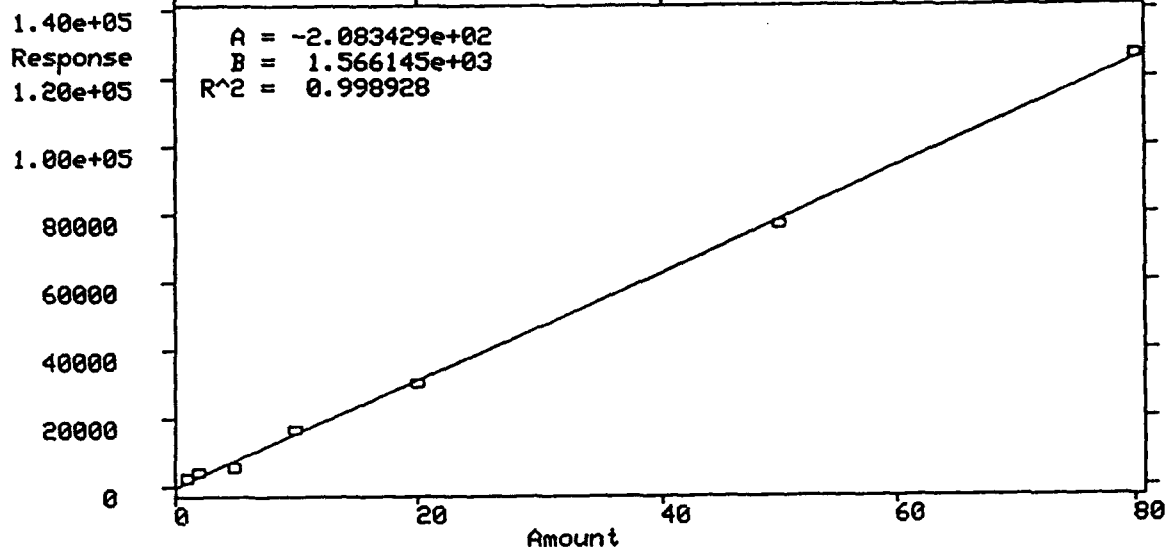
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2583.000000*	1	0.00	YES
2	2.000000	4180.000000*	1	0.00	YES
3	5.000000	5433.000000*	1	0.00	YES
4	10.000000	16577.000000*	1	0.00	YES
5	20.000000	30098.000000*	1	0.00	YES
6	50.000000	76491.000000*	1	0.00	YES
7	80.000000	126292.000000*	1	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method WIGVOC Peak TOLUENE Channel 1



Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
ETHYL-BENZENE	22.12	Linear	7	Height		1

Peak Name Coefficients

ETHYL-BENZENE A = -1.387148e+03  
 B = 2.080488e+03  
 R^2 = 0.998658

Level Table:

Peak Name: ETHYL-BENZENE Retention Time: 22.12 min

Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2809.000000*	1	0.00	YES
2	2.000000	4950.000000*	1	0.00	YES
3	5.000000	6703.000000*	1	0.00	YES
4	10.000000	20544.000000*	1	0.00	YES
5	20.000000	36684.000000*	1	0.00	YES
6	50.000000	101638.000000*	1	0.00	YES
7	80.000000	166484.000000*	1	0.00	YES

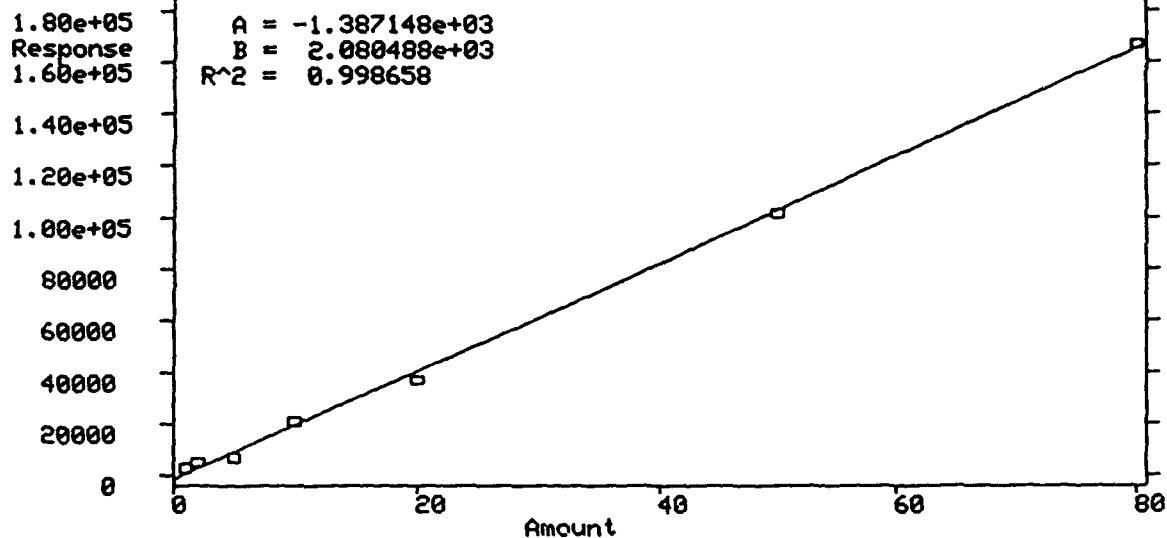
\* A manual response was entered for this level.



hannel 1 (continued)

Curves:

LC Calibration Method WIGVOC Peak ETHYL-BENZENE Channel 1



Channel Parameters:

Calibrate Channel ? YES

Retention Time Offset 0.00 sec

Relative Peak Window 7%

Absolute Peak Window 20 sec

Update Retention Time ? NO

Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
M&P-XYLENE	22.33	Linear	7	Height		1

Peak Name	Coefficients
M&P-XYLENE	A = -4.113142e+03
	B = 2.409013e+03
	R <sup>2</sup> = 0.999207

Level Table:

Peak Name: M&P-XYLENE Retention Time: 22.33 min

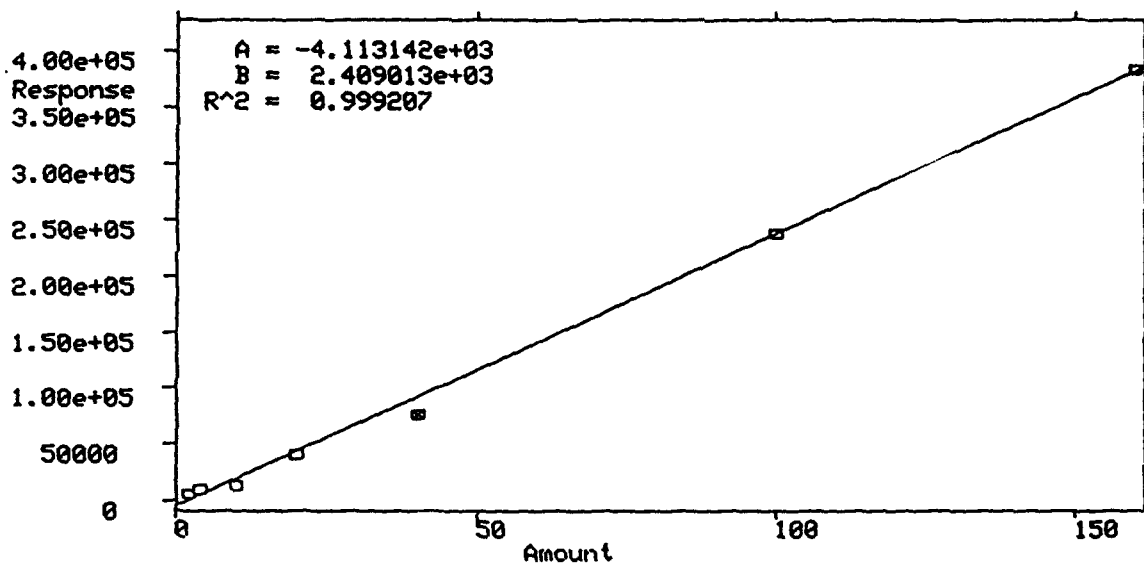
Level	Amount	Response	Reps	% RSD	Calibrate?
1	2.000000	5660.000000*	1	0.00	YES
2	4.000000	9960.000000*	1	0.00	YES
3	10.000000	13472.000000*	1	0.00	YES
4	20.000000	40656.000000*	1	0.00	YES
5	40.000000	76153.000000*	1	0.00	NO
6	100.000000	236425.000000*	1	0.00	YES
7	160.000000	382216.000000*	1	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method WIGVOC Peak M&amp;P-XYLENE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
O-XYLENE	23.43	Linear	7	Height		1

Peak Name	Coefficients
O-XYLENE	$A = -4.502373e+02$ $B = 1.947266e+03$ $R^2 = 0.999027$

## Level Table:

Peak Name: O-XYLENE Retention Time: 23.43 min

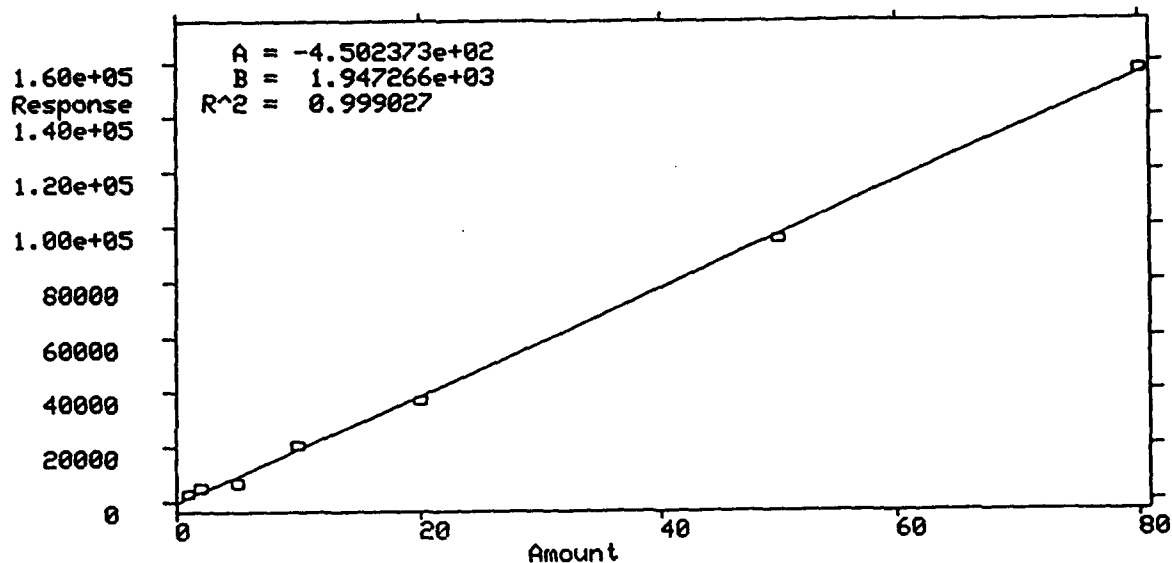
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2806.000000*	1	0.00	YES
2	2.000000	4993.000000*	1	0.00	YES
3	5.000000	6699.000000*	1	0.00	YES
4	10.000000	20589.000000*	1	0.00	YES
5	20.000000	36980.000000*	1	0.00	YES
6	50.000000	95282.000000*	1	0.00	YES
7	80.000000	156640.000000*	1	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method WIGVOC Peak O-XYLENE Channel 1



## Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

## Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
135-TMB	25.68	Linear	7	Height		1

Peak Name Coefficients  
 135-TMB  $A = -3.469401e+02$   
 $B = 2.690837e+03$   
 $R^2 = 0.999154$

## Level Table:

Peak Name: 135-TMB Retention Time: 25.68 min

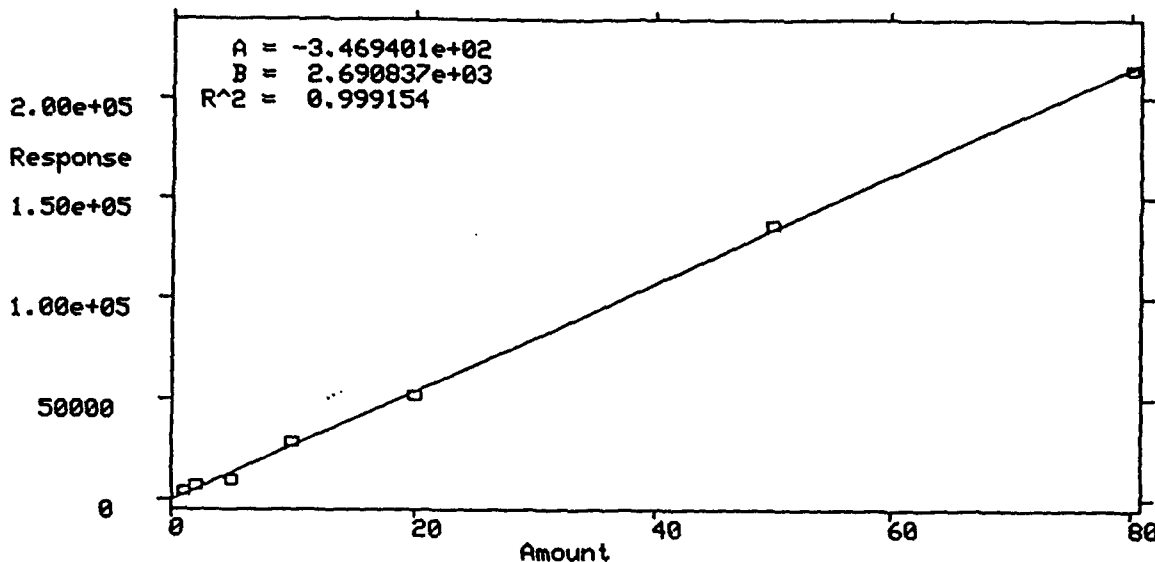
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	3748.000000*	1	0.00	YES
2	2.000000	6731.000000*	1	0.00	YES
3	5.000000	9151.000000*	1	0.00	YES
4	10.000000	28206.000000*	1	0.00	YES
5	20.000000	51357.000000*	1	0.00	YES
6	50.000000	136366.000000*	1	0.00	YES
7	80.000000	214073.000000*	1	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method WIGVOC Peak 135-TMB Channel 1



Channel Parameters:

Calibrate Channel ? YES  
 Retention Time Offset 0.00 sec  
 Relative Peak Window 7%  
 Absolute Peak Window 20 sec  
 Update Retention Time ? NO

Peak Table:

Peak Name	Ret Time	Fit Type	Levels	By	R I D	Group
124-TMB	26.55	Linear	7	Height		1

Peak Name	Coefficients
124-TMB	A = 1.921735e+02 B = 2.082630e+03 R^2 = 0.999065

Level Table:

Peak Name: 124-TMB Retention Time: 26.55 min

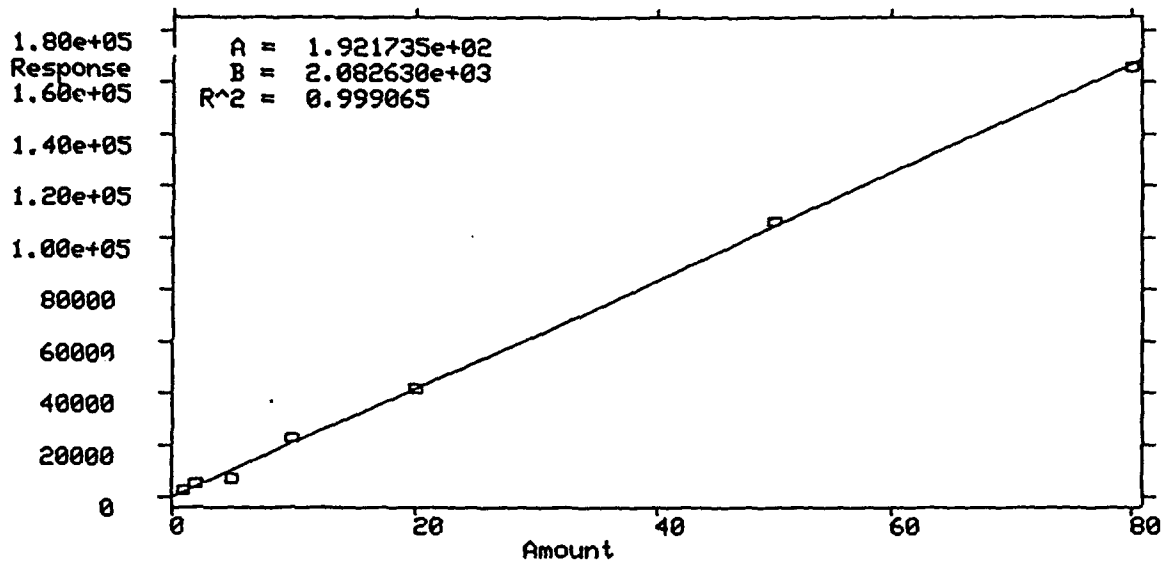
Level	Amount	Response	Reps	% RSD	Calibrate?
1	1.000000	2689.000000*	1	0.00	YES
2	2.000000	5162.000000*	1	0.00	YES
3	5.000000	7004.000000*	1	0.00	YES
4	10.000000	22782.000000*	1	0.00	YES
5	20.000000	41749.000000*	1	0.00	YES
6	50.000000	106221.000000*	1	0.00	YES
7	80.000000	165620.000000*	1	0.00	YES

\* A manual response was entered for this level.

Channel 1 (continued)

Curves:

LC Calibration Method WIGVOC Peak 124-TMB Channel 1



## WARZYN, INC.

Polynuclear Aromatic Hydrocarbons  
Method 8310--HPLC

BATCH #: 24583

Laboratory #: 7181-0013

Amount Extracted : 0.5 L

Extract Volume (ml) : 2.0 ml

Matrix (Soil/Water) : WATER

Date Extracted : 8/10/93

Spike Soln. Ref. : LOG69,P 24

CMPD CODE (PCODE)	COMPOUND	Spike Added ug/L	Sample Conc. ug/L	Matrix Spike Conc. ug/L	Percent Recovery (%)	Matrix Spike Duplicate Conc. ug/L	Percent Recovery (%)	Percent RPD (%)
NAPH	Naphthalene	40	0	38	94.28	36.2	90.56	4.03
ACEN	Acenaphthylene	80	0	77	96.25	73.9	92.37	4.71
ACE	Acenaphthene	40	0	38	94.6	36.4	90.95	3.93
FLUO	Fluorene	8	0	7.7	96.6	7.4	92.65	4.17
PHEN	Phenanthrene	4	0	3.8	95.7	3.6	90.5	5.59
ANTH	Anthracene	4	0	3.9	97.1	3.7	93.4	3.67
FLAN	Fluoranthene	8	0	8.2	102.55	7.9	99.3	3.22
PYRENE	Pyrene	4	0	3.8	94	3.7	91.6	2.59
BAA	Benzo(a)anthracene	4	0	3.4	84.6	3.2	79.3	6.47
CHRY	Chrysene	4	0	3.1	76.9	3.1	78.5	2.06
BBF	Benzo(b)fluoranthene	8	0	5.7	70.85	5.5	69.15	2.43
BKF	Benzo(k)fluoranthene	4	0	2.7	68.1	2.8	71.1	4.31
BAP	Benzo(a)pyrene	4	0	2.9	73.5	2.9	73.3	0.27
DIBENZ	Dibenzo(a,h)anthracene	8	0	4.7	58.5	4.1	51.35	13.02
BGHI	Benzo(ghi)perylene	8	0	4.9	61.3	4.5	56.25	8.59
IDENO	Indeno(123cd)pyrene	4	0	2.4	58.9	2.3	56.5	4.16

a -- Recovery outside of established limits.

b -- Relative percent difference (RPD) limit exceeded.

4 OF 32 SPIKING COMPOUNDS OUTSIDE OF ESTABLISHED RANGE

Calc. By : LU 8/11/93Chk'd By : PHH 8/12/93Finaled By : PHH 8/12/93

## WARZYN, INC.

Polynuclear Aromatic Hydrocarbons  
Method 8310--HPLC

BATCH #: 24583

Laboratory #: LFB 8/10/93

Amount Extracted : 0.5 L

Extract Volume (ml) : 2.0 ml

Matrix (Soil/Water) : WATER

Date Extracted : 8/10/93

Spike Soln. Ref. : LOG69,P 24

CMPD CODE (PCODE)	COMPOUND	Spike Added ug/L	Sample Conc. ug/L	Matrix Spike Conc. ug/L	Percent Recovery (%)	Matrix Spike Duplicate Conc. ug/L	Percent Recovery (%)	Percent RPD (%)
NAPH	Naphthalene	40	0	37	92.0 <sup>a</sup>	0.0		
ACEN	Acenaphthylene	80	0	78	98.1 <sup>a</sup>	0.0		
ACE	Acenaphthene	40	0	38	95.2 <sup>a</sup>	0.0		
FLUO	Fluorene	8	0	7.9	98.5 <sup>a</sup>	0.0		
PHEN	Phenanthrene	4	0	3.9	98.5	0.0		
ANTH	Anthracene	4	0	4.1	103.4	0.0		
FLAN	Fluoranthene	8	0	8.7	109.0 <sup>a</sup>	0.0		
PYRENE	Pyrene	4	0	4.2	104	0.0		
BAA	Benzo(a)anthracene	4	0	3.9	97.2	0.0		
CHRY	Chrysene	4	0	3.7	92.2	0.0		
BBF	Benzo(b)fluoranthene	8	0	7.7	95.0 <sup>a</sup> 86.9 <sup>a</sup>	0.0		
BKF	Benzo(k)fluoranthene	4	0	3.9	96.7	0.0		
BAP	Benzo(a)pyrene	4	0	4.0	99.5	0.0		
DIBENZ	Dibenzo(a,h)anthracene	8	0	5.0	62.9	0.0		
BGHI	Benzo(ghi)perylene	8	0	5.5	69.3 <sup>a</sup>	0.0		
IDENO	Indeno(123cd)pyrene	4	0	3.3	83.6	0.0		

Sig. for 8/10/93

Calc. By : ULL 8/10/93

Chk'd By :

Finald By : CHB 8/10/93

a -- Recovery outside of established limits.

b -- Relative percent difference (RPD) limit exceeded.

0 OF 16 SPIKING COMPOUNDS OUTSIDE OF ESTABLISHED RANGE

**WARZYN, INC.**

0 OF 14 SURROGATE RECOVERIES OUTSIDE OF RANGE



## Method Blank Summary Form

WARZYN, INC.

Polynuclear Aromatic Hydrocarbons  
Method 8310--HPLCMatrix (Soil/Water) : WATER  
Batch # : 24583

COMPOUNDS	Reporting Limit ug/L	BLANK ID 8/10/93	BLANK ID	BLANK ID	BLANK ID	BLANK ID
Naphthalene	10	<10				
Acenaphthylene	10	<10				
Acenaphthene	18	<18				
Fluorene	2.0	<2.0				
Phenanthrene	1.0	<1.0				
Anthracene	1.0	<1.0				
Fluoranthene	2.0	<2.0				
Pyrene	1.0	<1.0				
Benzo(a)anthracene	0.10	<0.10				
Chrysene	1.0	<1.0				
Benzo(b)fluoranthene	0.18	<0.18				
Benzo(k)fluoranthene	0.10	<0.10				
Benzo(a)pyrene	0.10	<0.10				
Indeno(123cd)pyrene	0.10	<0.10				
Dibenzo(ah)anthracene	0.20	<0.20				
Benzo(ghi)perylene	0.20	<0.20				
1-MethylNaphthalene	10	<10				
2-MethylNaphthalene	10	<10				

CALC. BY: VLT 8/11/93  
CHECKED BY: \_\_\_\_\_  
FINALED BY: BAR 8/12/93NR = NOT REQUESTED  
< RL = < Reporting Limit

**CHAIN OF CUSTODY RECORD**

PROJECT No. ASI 55005901 204	PROJECT NAME ASI - Hardwood Range
CITY & STATE Neenah Camp Douglas WI	

SAMPLERS (Signature) **BEN FORD**

LAB No.	DATE	TIME	COMP	GRAB	STATION LOCATION	No. OF CONTAINERS	GR0	GR0	PROG	PROG	DATE	REMARKS
7131-0001	8/9/43				HR-GT-SW	5	X	X				
0002					HR-GT-SSEW	5	X	X				
0003					HR-GT-SSE	5	X	X				Value prob. around HCL
0004					HR-GT-SSE	5	X	X				Amber later "
0005					HR-DT-SB	5	X	X				
0006					HR-DT-SN	5	X	X				HN03 L-2
0007					HR-DT-SW	5	X	X				
0008					HR-DT-SSE	5	X	X				
0009					HR-DT-SSE-D	5	X	X				
					Trip Blank	1						
					Metanol Blank	1	X	X				
0040					Decon - HR-WD	4	X	X				
Relinquished by: (Signature) <b>Ben Ford</b>						Received by: (Signature)		Date / Time		Received by: (Signature)		
Relinquished by: (Signature)						Received by: (Signature)		Date / Time		Received by: (Signature)		
Relinquished by: (Signature)						Received for Laboratory by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		

3 day TAT

REMARKS

intended, rec'd on rec, hand delivered

Project Manager: J. S. S.

8/19/43 5:00 PM

## CHAIN OF CUSTODY RECORD

[illegible]

3 day TAT

intended, we do not see, beyond difference

**Tank Inventory Forms and  
Checklist for Tank Closure**

Labor and Human Relations

# PETROLEUM PRODUCT TANK INVENTORY

Send Completed Form To:  
Safety & Buildings Division  
P.O. Box 7969  
Madison, WI 53707  
Telephone (608) 267-5280

For Office Use Only:

Tank ID #

Information Required By Sec. 101.142, Wis. Stats.

Underground tanks in Wisconsin that have stored or currently store petroleum or regulated substances must be registered. Please see the reverse side for additional information on this program. An underground storage tank is defined as any tank with at least 10 percent of its total volume (included piping) located below ground level. A separate form is needed for each tank. Send each completed form to the agency designated in the top right corner. Have you previously registered this tank by submitting a form? ☒ YES ☐ NO If yes, are you correcting/updating information only? ☒ Yes ☐ No

This registration applies to a tank that is (check one):

- 1A. ☐ In Use or 1B. ☐ Newly Installed 4. ☒ Closed - Tank Removed 8. ☐ Changed Ownership  
2. ☐ Abandoned With Product 6. ☐ Closed Filled With (Indicate new owner below)  
3. ☐ Abandoned No Product (empty) Inert Material  
or With Water 7. ☐ Out of Service - Provide Date: \_\_\_\_\_

Fire Department Providing Fire Coverage  
Where Tank Located:

Babcock Fire Dept

## A. IDENTIFICATION: (Please Print)

1. Tank Site Name

Air CRTE Hazardous Waste

Site Address

N. 1226 11th Ave North, WI 53707-1211

Site Telephone No

608-267-1211

☒ City☐ Village☐ Town of:

State

Zip Code

County

2. Owner Name (mail sent here unless indicated otherwise in #3 below)

Air National Guard - Volk Field AFB

Owner Mailing Address (mail sent here unless indicated otherwise in #3)

100 Independence Drive

☐ City☒ Village☐ Town of:

State

Zip Code

County

3. Alternate Mailing Name if Different Than #2

☐ City☐ Village☐ Town of:

State

Zip Code

County

4. Tank Age (date installed, if known; or years old)

unknown

5. Tank Capacity (gallons)

500

6. Tank Manufacturer's Name (if known)

unknown

## B. TYPE OF USER (check one):

1. ☐ Gas Station 2. ☐ Bulk Storage 3. ☐ Utility 4. ☐ Mercantile  
5. ☐ Industrial 6. ☒ Government 7. ☐ School 8. ☐ Residential  
9. ☐ Agricultural 10. ☐ Other (specify): \_\_\_\_\_

## C. TANK CONSTRUCTION:

1. ☐ Bare Steel 2. ☐ Cathodically Protected and Coated Steel (A. ☐ Sacrificial Anodes or B. ☐ Impressed Current)  
3. ☒ Coated Steel 4. ☐ Fiberglass 5. ☐ Other (specify): \_\_\_\_\_  
6. ☐ Relined - Date \_\_\_\_\_ 7. ☐ Steel - Fiberglass Reinforced Plastic Composite 9. ☐ Unknown

Approval: 1. ☐ Nat'l Std 2. ☒ UL 3. ☐ Other:Is Tank Double Walled? ☐ Yes ☒ NoOverfill Protection Provided? ☐ Yes ☒ No If yes, identify type:Spill Containment? ☐ Yes ☒ NoTank leak detection method: 1. ☐ Automatic tank gauging 2. ☐ Vapor monitoring 3. ☐ Groundwater monitoring 4. ☒ Inventory control and tightness testing 5. ☐ Interstitial monitoring 6. ☐ Not required at present 7. ☐ Manual Tank Gauging (only for tanks of 1,000 gallons or less)

## D. PIPING CONSTRUCTION

1. ☐ Bare Steel 2. ☐ Cathodically Protected and Coated or Wrapped Steel (A. ☐ Sacrificial Anodes or B. ☐ Impressed Current) 3. ☐ Coated Steel  
4. ☐ Fiberglass 5. ☐ Other (specify): \_\_\_\_\_ 9. ☐ Unknown

Piping System Type: 1. ☐ Pressurized piping with: A. ☐ auto shut-off; B. ☐ alarm; or C. ☐ flow restrictor 2. ☐ Suction piping with check valve at tank  
3. ☒ Suction piping with check valve at pump and inspectablePiping leak detection method: used if pressurized or check valve at tank: 1. ☐ Vapor monitoring 2. ☐ Interstitial monitoring  
3. ☐ Groundwater monitoring 4. ☐ Tightness testing 5. ☐ Line Leak Detector 6. ☒ Not RequiredApproval: 1. ☐ Nat'l Std 2. ☒ UL 3. ☐ Other:Double Walled: ☐ Yes ☒ No

## E. TANK CONTENTS

1. ☒ Diesel 2. ☐ Leaded 3. ☐ Unleaded 4. ☐ Fuel Oil  
5. ☐ Gasohol 6. ☐ Other 7. ☐ Empty 8. ☐ Sand/Gravel/Slurry  
9. ☐ Unknown 10. ☐ Premix 11. ☐ Waste Oil 12. ☐ Propane  
13. ☐ Chemical\* 14. ☐ Kerosene 15. ☐ Aviation

\* If # 13 is checked, indicate the chemical name(s) or number(s) of the chemical or waste

If Tank Closed, Give Date (month/year):

7-28-93

Has a site assessment been completed? (see reverse side for details)

☒ Yes ☐ No

If installation of a new tank is being reported, indicate who performed the installation inspection:

1. ☐ Fire Department 2. ☐ DILHR 3. ☐ Other (Identify) \_\_\_\_\_

Name of Owner or Operator (please print):

Air National Guard - Volk Field AFB

Indicate Whether:

☐ Owner or ☐ Operator

Signature of Owner or Operator:

Date Signed:

7-28-93

SD-7437 (R. 04/92)

IMPORTANT: Complete as many items on this form as possible. Failure to provide sufficient information may cause you to fall under additional regulations.

## Labor and Human Relations

## CHECKLIST FOR UNDERGROUND

**Complete one form for each site closure.**

## TANK CLOSURE

Safety & Buildings Division  
Fire Prevention & Underground  
Storage Tank Section  
P. O. Box 7969, Madison, WI 53707

## A. IDENTIFICATION: (Please Print)

1. Installation Name <u>Sub CRTC Hazardous Waste</u>			2. Owner Name <u>A.E. National Hazardous Waste Inc.</u>		
Installation Street Address <u>1125 11th Ave North</u>			Owner Street Address <u>1000 1st Avenue North</u>		
<input checked="" type="checkbox"/> City	<input type="checkbox"/> Village	<input type="checkbox"/> Town of	<input type="checkbox"/> City	<input checked="" type="checkbox"/> Village	<input type="checkbox"/> Town of
State <u>WI</u>	Zip Code <u>53646</u>	County <u>Jackson</u>	State <u>WI</u>	Zip Code <u>53646</u>	County <u>Jackson</u>
3. Closure Company Name <u>Prosecco &amp; Son Inc.</u>			Closure Company Street Address, City, State, Zip Code <u>990 N. Lincoln St. P.O. Box 54012</u>		
Company Telephone No. (include area code) <u>(715) 443-4077</u>			Certified Remover Name <u>Robert J. Prosecco</u>		
4. Name of Company Performing Closure Assessment <u>Advanced Technical Inc.</u>			Assessment Company Street Address, City, State, Zip Code <u>165 N. Lincoln Rd. Oak Ridge TN 37930</u>		
Company Telephone No. (include area code) <u>(615) 482-1274</u>			Certified Assessor Name <u>Robert L. Prosecco</u>		
			Assessor Certification No. <u>05360</u>		

Tank ID #	Closure	Temp. Closure	Closure In Place	Tank Capacity	Contents *	Closure Assessment
1.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	560	DI	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N

\* Indicate which product by numeric code: 01-Diesel; 02-Leaded; 03-Unleaded; 04-Fuel Oil; 05-Gasohol; 06-Other; 09-Unknown; 10-Premix; 11-Waste oil; 13-Chemical (indicate the chemical name(s) or number(s)); 14-Kerosene; 15-Aviation.

Notification was provided to the local authorities 15 days in advance of closure date. ☐ Y ☐ N ☐ NA  
All local permits were obtained before beginning closure. ☐ Y ☐ N ☐ NA

Check applicable box at right in response to all statements in Sections B - E.

## B. TEMPORARILY OUT OF SERVICE

	Remover Verified	Inspector Verified	NA
1. Product Removed			
a. Product lines drained into tank (or other container) and resulting liquid removed, AND	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. All product removed to bottom of suction line, OR	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. All product removed to within 1" of bottom.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Fill pipe, gauge pipe, tank truck vapor recovery fittings, and vapor return lines capped.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. All product lines at the islands or pumps located elsewhere are removed and capped, OR	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Dispensers/pumps left in place but locked and power disconnected.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Vent lines left open.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Written Inspector approval of temporary closure obtained, which is effective until _____ (Date)	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Inventory form filed by owner indicating temporary closure.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## C. CLOSURE BY REMOVAL

1. Product from piping drained into tank (or other container).	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
2. Piping disconnected from tank and capped or removed.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
3. All liquid and residue removed from tank using explosion proof pumps or hand pumps.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
4. All pump motors and suction hoses bonded to tank or otherwise grounded.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
5. Fill pipes, gauge pipes, vapor recovery connections, submersible pumps and other fixtures removed.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
NOTE: DROP TUBE SHOULD NOT BE REMOVED IF THE TANK IS TO BE PURGED THROUGH THE USE OF AN EDUCTOR.			
7. Vent lines left connected until tanks purged.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
8. Tank openings temporarily plugged so vapors exit through vent.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
9. Tank atmosphere reduced to 10% of the lower flammable range (LEL) - see Section F.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>
10. Tank removed from excavation after PURGING/VENTING; placed on level ground and blocked to prevent movement.	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>

## C. CLOSURE BY REMOVAL (continued)

12. Tank labeled in 2" high letters after removal but before being moved from site.

Verified ☒ Y ☐ N Verified ☐ Y ☐ N

NOTE: COMPLETE TANK LABELING SHOULD INCLUDE WARNING AGAINST REUSE, FORMER CONTENTS, VAPOR STATE, VAPOR FREEING TREATMENT, DATE.

13. Tank vent hose (1/8 in. in uppermost part of tank) installed prior to moving the tank from site.

☒ Y ☐ N ☐ Y ☐ N

14. Inventory form filed by owner with Safety and Buildings Division indicating closure by removal.

☒ Y ☐ N ☐ Y ☐ N

15. Site security is provided while the excavation is open.

☒ Y ☐ N ☐ Y ☐ N

## D. CLOSURE IN PLACE

NOTE: CLOSURES IN PLACE ARE ONLY ALLOWED WITH THE PRIOR APPROVAL OF THE DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS.

1. Product from piping drained into tank (or other container).  
2. Piping disconnected from tank and capped or removed.  
3. All liquid and residue removed from tank using explosion proof pumps or hand pumps.  
4. All pump motors and suction hoses bonded to tank or otherwise grounded.  
5. Fill pipes, gauge pipes, vapor recovery connections, submersible pumps and other fixtures removed.

☐ Y ☐ N ☐ Y ☐ N  
☐ Y ☐ N ☐ Y ☐ N  
☐ Y ☐ N ☐ Y ☐ N  
☐ Y ☐ N ☐ Y ☐ N

NOTE: DROP TUBE SHOULD NOT BE REMOVED IF THE TANK IS TO BE PURGED THROUGH THE USE OF AN EDUCTOR.

6. Vent lines left connected until tanks purged.  
7. Tank openings temporarily plugged so vapors exit through vent.  
8. Tank atmosphere reduced to 10% of the lower flammable range (LEL) - see Section F.  
9. Openings cut in tank top if necessary to introduce inert material.  
10. Solid inert material (sand, cyclone boiler slag, pea gravel recommended) introduced and tank filled.  
11. Vent line disconnected or removed.  
12. Inventory form filed by owner with Safety and Buildings Division indicating closure in place.

☐ Y ☐ N ☐ Y ☐ N  
☐ Y ☐ N ☐ Y ☐ N  
☐ Y ☐ N ☐ Y ☐ N  
☐ Y ☐ N ☐ Y ☐ N  
☐ Y ☐ N ☐ Y ☐ N  
☐ Y ☐ N ☐ Y ☐ N

## E. CLOSURE ASSESSMENTS

NOTE: DETERMINE IF A CLOSURE ASSESSMENT IS REQUIRED BY REFERRING TO IHR 10.

1. Individual conducting the assessment has a closure assessment plan (written) which is used as the basis for their work on the site.

☒ Y ☐ N ☐ Y ☐ N

2. Do points of obvious contamination exist?

☒ Y ☐ N ☐ Y ☐ N

3. Are there strong odors in the soils?

☒ Y ☐ N ☐ Y ☐ N

4. Was a field screening instrument used to pre-screen soil sample locations?

☒ Y ☐ N ☐ Y ☐ N

5. Was a closure assessment omitted because of obvious contamination?

☒ Y ☐ N ☐ Y ☐ N

6. Was the DNR notified of suspected or obvious contamination?

☒ Y ☐ N ☐ Y ☐ N

Agency and office contacted: Shawmut Design Delta Environmental

7. Contamination suspected because of: ☒ Odor ☒ Soil Staining ☐ Free Product ☐ Sheen On Groundwater ☐ Field Instrument Test

## F. METHOD OF ACHIEVING 10% LEVEL DESCRIPTION

Eductor Or Diffused Air Blower

Eductor driven by compressed air, bonded and drop tube removed; vapors discharged minimum of 12 feet above ground.

Diffused air blower bonded and drop tube removed. Air pressure not exceeding 5 psig.

Dry Ice

Dry ice introduced at 1.5 pounds per 100 gallons of tank capacity. Dry ice crushed and distributed over the greatest possible tank area. Dry ice evaporated before proceeding.

✓ Inert Gas (CO<sub>2</sub> or N<sub>2</sub>) NOTE: INERT GASSES PRODUCE AN OXYGEN DEFICIENT ATMOSPHERE. THE TANK MAY NOT BE ENTERED IN THIS STATE WITHOUT SPECIAL EQUIPMENT

Gas introduced through a single opening at a point near the bottom of the tank at the end of the tank opposite the vent.

Gas introduced under low pressure not to exceed 5 psig to reduce static electricity. Gas introducing device grounded.

✓ Tank atmosphere monitored for flammable or combustible vapor levels.

Calibrate combustible gas indicator. Drop tube removed prior to checking atmosphere. Tank space monitored at bottom, middle and upper portion of tank. Readings of 10% or less of the lower flammable range (LEL) obtained before removing tank from ground.

## G. NOTE SPECIFIC PROBLEMS OR NONCOMPLIANCE ISSUES BELOW

Tank clean - no issues

## I. INSPECTOR INFORMATION

Inspector Name (print)

Inspector Signature

Inspector Certification No.

Field # For Location Where Inspection Performed

Inspector Telephone Number

Date Signed

OWNER

Wisconsin Department of Industry,  
Labor and Human Relations

*hardwood gasoline*

# UNDERGROUND PETROLEUM PRODUCT TANK INVENTORY

Send Completed Form To:  
Safety & Buildings Division  
P.O. Box 7969  
Madison, WI 53707  
Telephone (608) 267-5280

For Office Use Only:  
Tank ID #

Information Required By Sec. 102.142, Wis. Stats.

Underground tanks in Wisconsin that have stored or currently store petroleum or regulated substances must be registered. Please see the reverse side for additional information on this program. An underground storage tank is defined as any tank with at least 10 percent of its total volume (included piping) located below ground level. A separate form is needed for each tank. Send each completed form to the agency designated in the top right corner. Have you previously registered this tank by submitting a form? ☒ YES ☐ NO If yes, are you correcting/updating information only? ☒ Yes ☐ No

This registration applies to a tank that is (check one):

- 1A. ☐ In Use or 1B. ☐ Newly Installed  
2. ☐ Abandoned With Product  
3. ☐ Abandoned No Product (empty) or With Water  
4. ☒ Closed - Tank Removed  
5. ☐ Closed - Filled With Inert Material  
7. ☐ Out of Service - Provide Date: \_\_\_\_\_  
8. ☐ Changed Ownership (Indicate new owner below)

Fire Department Providing Fire Coverage  
Where Tank Located:

*Babcock Fire Dept*

## A. IDENTIFICATION: (Please Print)

1. Tank Site Name

*Air CRTC Hardwood Range*

Site Address

*N. 11226 11th Ave North*

Site Telephone No.

*(608) 427-1211*

☒ City

*Neenah*

☐ Village

☐ Town of:

State

*WI*

Zip Code

*54601*

County

*JUNEAU*

2. Owner Name (mail sent here unless indicated otherwise in #3 below)

*Air National Guard - Volk Field ANG*

Owner Mailing Address (mail sent here unless indicated otherwise in #3)

*100 Independence Drive*

☐ City

*Camp Douglas*

☐ Village

☐ Town of:

State

*WI*

Zip Code

*53618-501*

County

*JUNEAU*

3. Alternate Mailing Name if Different Than #2

Alternate Mailing Street Address if Different From #2

☐ City

☐ Village

☐ Town of:

State

Zip Code

County

4. Tank Age (date installed, if known; or years old)

*UNKNOWN*

5. Tank Capacity (gallons)

*1000*

6. Tank Manufacturer's Name (if known)

*UNKNOWN*

## B. TYPE OF USER (check one):

1. ☐ Gas Station  
2. ☐ Bulk Storage  
3. ☐ Utility  
4. ☐ Mercantile  
5. ☐ Industrial  
6. ☒ Government  
7. ☐ School  
8. ☐ Residential  
9. ☐ Agricultural  
10. ☐ Other (specify): \_\_\_\_\_

## C. TANK CONSTRUCTION:

1. ☐ Bare Steel  
2. ☐ Cathodically Protected and Coated Steel (A. ☐ Sacrificial Anodes or B. ☐ Impressed Current)  
3. ☒ Coated Steel  
4. ☐ Fiberglass  
5. ☐ Other (specify): \_\_\_\_\_  
6. ☐ Relined - Date: \_\_\_\_\_  
7. ☐ Steel - Fiberglass Reinforced Plastic Composite  
9. ☐ Unknown

Approval: 1. ☐ Nat'l Std. 2. ☒ UL 3. ☐ Other:

Is Tank Double Walled? ☐ Yes ☒ No

Overfill Protection Provided? ☐ Yes ☒ No If yes, identify type:

Spill Containment? ☐ Yes ☒ No

Tank leak detection method: 1. ☐ Automatic tank gauging 2. ☐ Vapor monitoring 3. ☐ Groundwater monitoring 4. ☒ Inventory control and tightness testing 5. ☐ Interstitial monitoring 6. ☐ Not required at present 7. ☐ Manual Tank Gauging (only for tanks of 1,000 gallons or less)

## D. PIPING CONSTRUCTION

1. ☐ Bare Steel 2. ☐ Cathodically Protected and Coated or Wrapped Steel (A. ☐ Sacrificial Anodes or B. ☐ Impressed Current) 3. ☐ Coated Steel  
4. ☐ Fiberglass 5. ☐ Other (specify): \_\_\_\_\_ 9. ☐ Unknown

Piping System Type: 1. ☐ Pressurized piping with: A. ☐ auto shutoff; B. ☐ alarm; or C. ☐ flow restrictor 2. ☐ Suction piping with check valve at tank  
3. ☒ Suction piping with check valve at pump and inspectable

Piping leak detection method: used if pressurized or check valve at tank: 1. ☐ Vapor monitoring 2. ☐ Interstitial monitoring  
3. ☐ Groundwater monitoring 4. ☐ Tightness testing 5. ☐ Line Leak Detector 6. ☒ Not Required

Approval: 1. ☐ Nat'l Std. 2. ☒ UL 3. ☐ Other:

Double Walled: ☐ Yes ☒ No

## E. TANK CONTENTS

1. ☐ Diesel 2. ☐ Leaded 3. ☒ Unleaded 4. ☐ Fuel Oil  
5. ☐ Gasohol 6. ☐ Other 7. ☐ Empty 8. ☐ Sand/Gravel/Slurry  
9. ☐ Unknown 10. ☐ Premix 11. ☐ Waste Oil 12. ☐ Propane  
13. ☐ Chemical 14. ☐ Kerosene 15. ☐ Aviation

\* If # 13 is checked, indicate the chemical name(s) or number(s) of the chemical or waste:

If Tank Closed, Give Date (month/day/year):

*7-28-93*

Has a site assessment been completed? (see reverse side for details)

☒ Yes ☐ No

If installation of a new tank is being reported, indicate who performed the installation inspection:

1. ☐ Fire Department 2. ☐ DHR 3. ☐ Other (identify): \_\_\_\_\_

Name of Owner or Operator (please print):

*Air National Guard - Volk Field ANG*

Indicate Whether:

☒ Owner or ☐ Operator

Signature of Owner or Operator:

*[Signature]*

Date Signed:

*7-28-93*



Wisconsin Department of Industry,  
Labor and Human Relations

## CHECKLIST FOR UNDERGROUND TANK CLOSURE

RETURN COMPLETED CHECKLIST TO:  
Safety & Buildings Division  
Fire Prevention & Underground  
Storage Tank Section  
P. O. Box 7969, Madison, WI 53707

Complete one form for  
each site closure.

### A. IDENTIFICATION: (Please Print)

1. Installation Name <u>SNL CPTC HARDWOOD RANG</u>			2. Owner Name <u>RIA NATIONAL FARM - WILKESVILLE</u>		
Installation Street Address <u>11226 11th Ave North</u>			Owner Street Address <u>100 W. Lincoln Ave</u>		
<input checked="" type="checkbox"/> City	<input type="checkbox"/> Village	<input type="checkbox"/> Town of	<input type="checkbox"/> City	<input type="checkbox"/> Village	<input type="checkbox"/> Town of
State <u>NEBRASKA</u>		Zip Code <u>68104</u>	State <u>ILLINOIS</u>		Zip Code <u>60112</u>
County <u>JEFFERSON</u>		County <u>JEFFERSON</u>	Telephone No. (include area code) <u>(608) 467-1441</u>		
3. Closure Company Name <u>BARRETT &amp; BELLOCK INC.</u>			Closure Company Street Address, City, State, Zip Code <u>990 Hill Street Suite 107 Oak Brook, IL 60112</u>		
Company Telephone No. (include area code) <u>(715) 694-2077</u>			Certified Remover Name <u>KEVIN BELLOCK</u>		Remover Certification No. <u>10205</u>
4. Name of Company Performing Closure Assessment <u>AMERICAN SOUTHERN</u>			Assessment Company Street Address, City, State, Zip Code <u>1000 N. 1st St. Lincoln, NE 68502</u>		
Company Telephone No. (include area code) <u>(615) 455-1574</u>			Certified Assessor Name <u>JOHN E. FORD</u>		Assessor Certification No. <u>05360</u>

Tank ID #	Closure	Temp. Closure	Closure In Place	Tank Capacity	Contents *	Closure Assessment
1.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1000	03	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
4.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/> Y <input type="checkbox"/> N

\* Indicate which product by numeric code: 01-Diesel; 02-Leaded; 03-Unleaded; 04-Fuel Oil; 05-Gasohol; 06-Other; 09-Unknown; 10-Premix;  
11-Waste oil; 13-Chemical (indicate the chemical name(s) or number(s)); 14-Kerosene; 15-Aviation.

Notification was provided to the local authorities 15 days in advance of closure date. ☒ Y ☐ N ☐ NA

All local permits were obtained before beginning closure. ☒ Y ☐ N ☐ NA

Check applicable box at right in response to all statements in Sections B - E.

### B. TEMPORARILY OUT OF SERVICE

Remover Verified Inspector Verified NA

- |  |   |                          |                                     |
|--|---|--------------------------|-------------------------------------|
| 1. Product Removed   |   |                          |                                     |
| a. Product lines drained into tank (or other container) and resulting liquid removed, AND    | <input type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. All product removed to bottom of suction line, OR   | <input type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. All product removed to within 1" of bottom.   | <input type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Fill pipe, gauge pipe, tank truck vapor recovery fittings, and vapor return lines capped. | <input type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. All product lines at the islands or pumps located elsewhere are removed and capped, OR    | <input type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Dispensers/pumps left in place but locked and power disconnected.                         | <input type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Vent lines left open.   | <input type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Written inspector approval of temporary closure obtained, which is effective until (Date) | <input type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Inventory form filed by owner indicating temporary closure.                               | <input type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### C. CLOSURE BY REMOVAL

- |  |  |                          |                          |
|--|--|--------------------------|--------------------------|
| 1. Product from piping drained into tank (or other container).   | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Piping disconnected from tank and capped or removed.  | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. All liquid and residue removed from tank using explosion proof pumps or hand pumps.                           | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. All pump motors and suction hoses bonded to tank or otherwise grounded.                                       | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Fill pipes, gauge pipes, vapor recovery connections, submersible pumps and other fixtures removed.            | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input type="checkbox"/> |
| NOTE: DROP TUBE SHOULD NOT BE REMOVED IF THE TANK IS TO BE PURGED THROUGH THE USE OF AN EDUCTOR.                 |  |                          |                          |
| 7. Vent lines left connected until tanks purged.   | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Tank openings temporarily plugged so vapors exit through vent.  | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Tank atmosphere reduced to 10% of the lower flammable range (LEL) - see Section F.                            | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Tank removed from excavation after PURGING/INERTING; placed on level ground and blocked to prevent movement. | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N | <input type="checkbox"/> | <input type="checkbox"/> |

**C. CLOSURE BY REMOVAL (continued)**

12. Tank labeled in 2" high letters after removal but before being moved from site.

NOTE: COMPLETE TANK LABELING SHOULD INCLUDE WARNING AGAINST REUSE; FORMER CONTENTS; VAPOR STATE; VAPOR FREATMENT; DATE.

13. Tank vent hole (1/8 in. in uppermost part of tank) installed prior to moving the tank from site.

14. Inventory form filed by owner with Safety and Buildings Division indicating closure by removal.

15. Site security is provided while the excavation is open.

Vented	Vented
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

**D. CLOSURE IN PLACE**

NOTE: CLOSURES IN PLACE ARE ONLY ALLOWED WITH THE PRIOR APPROVAL OF THE DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS.

- Product from piping drained into tank (or other container).
- Piping disconnected from tank and capped or removed.
- All liquid and residue removed from tank using explosion proof pumps or hand pumps.
- All pump motors and suction hoses bonded to tank or otherwise grounded.
- Fill pipes, gauge pipes, vapor recovery connections, submersible pumps and other fixtures removed.
- Vent lines left connected until tanks purged.
- Tank openings temporarily plugged so vapors exit through vent.
- Tank atmosphere reduced to 10% of the lower flammable range (LEL) - see Section F.
- Openings cut in tank top if necessary to introduce inert material.
- Solid inert material (sand, cyclone boiler slag, pea gravel recommended) introduced and tank filled.
- Vent line disconnected or removed.
- Inventory form filed by owner with Safety and Buildings Division indicating closure in place.

<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

**E. CLOSURE ASSESSMENTS**

NOTE: DETERMINE IF A CLOSURE ASSESSMENT IS REQUIRED BY REFERRING TO ILHR 10.

- Individual conducting the assessment has a closure assessment plan (written) which is used as the basis for their work on the site.
- Do points of obvious contamination exist?
- Are there strong odors in the soils?
- Was a field screening instrument used to pre-screen soil sample locations?
- Was a closure assessment omitted because of obvious contamination?
- Was the DNR notified of suspected or obvious contamination?

<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

Agency and office contacted:

7. Contamination suspected because of:
- ☐
- Odor
- ☐
- Soil Staining
- ☐
- Free Product
- ☐
- Sheen On Groundwater
- ☐
- Field Instrument Test

**F. METHOD OF ACHIEVING 10% LEVEL DESCRIPTION**

Eductor Or Diffused Air Blower

Eductor driven by compressed air, bonded and drop tube left in place; vapors discharged minimum of 12 feet above ground.

Diffused air blower bonded and drop tube removed. Air pressure not exceeding 5 psig.

## - Dry Ice

Dry ice introduced at 1.5 pounds per 100 gallons of tank capacity. Dry ice crushed and distributed over the greatest possible tank area. Dry ice evaporated before proceeding.

✓ Inert Gas (CO<sub>2</sub> or N<sub>2</sub>) NOTE: INERT GASSES PRODUCE AN OXYGEN DEFICIENT ATMOSPHERE. THE TANK MAY NOT BE ENTERED IN THIS STATE WITHOUT SPECIAL EQUIPMENT

Gas introduced through a single opening at a point near the bottom of the tank at the end of the tank opposite the vent.

Gas introduced under low pressure not to exceed 5 psig to reduce static electricity. Gas introducing device grounded.

## ✓ Tank atmosphere monitored for flammable or combustible vapor levels.

Calibrate combustible gas indicator. Drop tube removed prior to checking atmosphere. Tank space monitored at bottom, middle and upper portion of tank. Readings of 10% or less of the lower flammable range (LEL) obtained before removing tank from ground.

**G. NOTE SPECIFIC PROBLEMS OR NONCOMPLIANCE ISSUES BELOW**

1. Tank not cleaned out before closure.

**I. INSPECTOR INFORMATION**

Inspector Name (print)

Inspector Signature

Inspector Certification No.

FDID # For Location Where Inspection Performed

Inspector Telephone Number

Date Signed

OWNER